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AND THE

ART OF PRESCRIBING

BY

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[*Dedication of the First Edition*]

TO THE

REV. PROFESSOR HAUGHTON, M.D., F.R.S.

FELLOW AND MEDICAL REGISTRAR OF TRINITY COLLEGE, DUBLIN

This Little Volume is Inscribed,

AS A SLIGHT TOKEN OF THE ESTIMATION

IN WHICH

HIS LABOURS IN THE CAUSE OF MEDICAL EDUCATION

ARE HELD BY

THE AUTHOR.

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PREF

The publication of these
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of my pupils, and also be-
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work.

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Prescription, is my very ear-

W. H.

W. H. STEPHENSON
1872

The Editor has been
the President of the
Association.

PREFACE

THE publication of these lessons was undertaken in response to a frequently-expressed desire on the part of my pupils, and also because I believe that there exists a very great demand for some such educational work.

The notes taken by an intelligent student have been used as the basis of this little book, and the "Lessons" are published almost word for word as they were delivered. The colloquial style may be considered a defect, but this will, I am sure, be more than counterbalanced by the individuality of the teaching.

That the publication of this little work may serve in some degree to conduce to the study of the Art of Prescribing is my very earnest hope.

W. HANDSEL GRIFFITHS.

2 UPPER FITZWILLIAM STREET, DUBLIN.

April 1875.

This Edition has been carefully revised and adapted to the British Pharmacopœia of 1898.

THE PUBLISHERS.

September 1899.

CONTE

LESSON

INTRODUCTION
THE GRAMMATICAL CONSTRUCTION

LESSON

THE FORM OF A PRESCRIPTION.

LESSON

THE USE OF SYMBOLS.

LESSON

THE USE OF CLAUSES AND THE
THE ABBREVIATIONS AND

LESSON

THE FORM OF A MEMORANDUM.

LESSON

THE FORM OF A LETTER.

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LESSONS ON PR
AN
ART OF PR
LESS
INTRO
In commencing this brief
Art of Prescribing I wish
that I shall be actuated by
you to pass your examination
impart such a knowledge of
you will put yourselves in
of professional life it may
most to understand, however,
prescriptions are almost
Latin tongue, it will form
molecular the elements of
your art. I must suppose
of the art, and that
which you have
effortfully searching to re
this matter. At the sa
of your careful attent on
which more imm
and to inv
phases of Medicine

I speak of *phraseology*, for you must understand that a knowledge of classical Latin will not enable you either to write or to translate an orthodox prescription. Literal translation of many phrases in common use may lead you into very serious error, in illustration of which I may remind you of the story which is told of the raw apprentice who translated the words, "*pro re natâ*," as, "for the thing that is born," with results which may be better imagined than described. And now, gentlemen, let me ask you to set its true value on a knowledge of the art of prescription-writing. Remember that the diction of a typical prescription is one of the most crucial tests of an accomplished physician, implying as it does the most extensive and varied professional attainments. Although the colleges and examining boards do not lay sufficient stress on the importance of prescription-writing, let not this fact deter you from an earnest study of the art. If no higher motive should actuate you, reflect that an erroneous prescription bearing your signature may place you at the mercy of the unfriendly criticism of an apothecary's apprentice.

You may ask what, after all, is the necessity for inditing prescriptions in the Latin tongue? There are at least two cogent reasons: first, a prescription in Latin can be deciphered in almost every quarter of the globe; and, secondly, it is often necessary to conceal from our patient that he is taking a certain drug.

After these prefatory remarks, which I trust will not be unprofitable, we will now commence our studies with a consideration of

THE GRAMMATICAL CONSTRUCTION OF A PRESCRIPTION

In introducing you to this part of the subject I will follow the example of Pereira¹ by giving you a grammatical analysis of an ordinary prescription. A careful study of this will enable you to understand the *rationale* of the construction of most prescriptions. In the form of a diagram I will take each word as it occurs, parse it, and indicate the rule of syntax which it exemplifies. (*See next page.*)

The following prescription, which I have modified from one in Pereira's *Selections*, illustrates two most important rules, to which I ask your special attention: it shows that—

1st. The name of the medicine is put in the genitive when the quantity of it to be used is expressed.

2nd. The quantity is put in the accusative, being governed by the verb *Recipe*.

There yet remain for consideration some other important rules, which a few phrases of frequent occurrence will serve to illustrate:—

"*Divide in pilulas tres, quarum sumat unam omni nocte.*" This little sentence is demonstrative of the rule that the relative pronoun (*quarum*) agrees with its antecedent (*pilulas*) both in gender and in number. It moreover shows that nouns signifying the *time when* are put in the ablative, but you must bear in mind that nouns signifying *how long*, as "*per horam*," are generally put in the accusative, the prepositions *per*, *ad*, *in*, *intra*, and *inter*, being often expressed.

¹ *Selecta à Prescriptis*. The author owes to this little work most of the composition of this lesson.

DIAGRAM SHOWING THE GRAMMATICAL CONSTRUCTION OF A PRESCRIPTION

R = RECIPE (Take)	PULVERIS (of powder)	SCAMMONIÆ (of scammony)	SCRUPULUM (a scruple)	DIMIDIUM (half)
Active verb, imperative mood, second person singular, agreeing with <i>Tu</i> understood; from <i>Recipio</i> , etc.	Substantive, genitive, singular; from <i>Pulvis</i> , etc. Governed by <i>Scrupulum</i> .	Substantive, genitive, singular; from <i>Scammonia</i> , etc. Governed by <i>Pulveris</i> .	Substantive, accusative, singular; from <i>scrupulus</i> , etc. Governed by <i>Recipe</i> .	Adjective, accusative, singular, masculine; from <i>Dimidius</i> , etc. Agreeing with <i>Scrupulum</i> .
A personal verb agrees with its nominative in number and person.	One substantive governs another signifying a different thing in the genitive.	The substantive governed may govern another signifying a different thing.	A verb signifying activity governs the accusative.	Adjectives, participles, and pronouns agree with the substantive in gender, number, and case.
R (understood).	PULVERIS (of powder)	JALAPÆ (of jalap)	GRANA (grains)	QUINQUE (five)
As above. Governed by <i>Grana</i> .	Substantive, genitive, singular; from <i>Jalap</i> , etc. Governed by <i>Pulveris</i> .	Substantive, accusative, plural, neuter; from <i>grana</i> , etc. Governed by <i>Recipe</i> .	Substantive, accusative, plural, neuter; from <i>grana</i> , etc. Governed by <i>Recipe</i> .	Adjective, indeclinable.
R (understood).	CALOMELANOS (of calomel)		GRANA (grains)	TRIA (three)
Substantive, genitive, singular; from <i>Calomelus</i> . Governed by <i>Grana</i> .	Rule as above.	Rule as above.	Rule as above.	Adjective, accusative, plural, neuter; from <i>Tres</i> , etc. Agreeing with <i>Grana</i> .
M = MISCE (Mix)	FIAT (Make)	PULVIS (a powder)	PURGANS (purgative)	Rule as above.
Active verb, imperative mood, second person singular, agreeing with <i>Tu</i> understood; from <i>Misceo</i> , etc.	Verb, imperative mood; from <i>Fio</i> , etc. Governed by <i>Pulvis</i> .	Substantive, nominative, singular, masculine, line. Subject of <i>Fiat</i> .	Participle, nominative, singular, masculine, agreeing with <i>Pulvis</i> .	

Rule as above.

While speaking of prepositions I may mention that the following govern the accusative: *ad, apud, ante, inter, per, in* (=into), as "*ad uncias decem*"; whereas the following govern the ablative: *a, ab, cum, de, ex, pro, in* (=in), as "*in pulvere*." The sentence "*Haustus et pilulæ sumantur*" will serve to illustrate the rule that when several substantives singular are coupled by a conjunction they generally take a verb, adjective, or relative pronoun plural. I may here remind you that the conjunctions, *et, ac, atque, aut, vel*, etc., couple like cases of nouns and moods of verbs, as "*Duabus vel tribus horis*." The following conjunctions generally govern the subjunctive mood: *ut, si, ne, donec*, etc., as "*Ut fiat haustus*." Adjectives signifying quantity are followed by a genitive, as "*Plus calicis*."

In the sentence "*Si ægro balneo calido opus sit*" we have an exemplification of the rule that *opus, usus*, and nouns denoting necessity, govern the ablative of the thing wanted (*balneo*), and the dative of that for which it is wanted (*ægro*). The sentence "*Utatur balneo frigido*" is also an exemplification of the rule that *utor* and some other words (participles, *natus, editus, creatus*, etc.,) govern the ablative.

The sentence "*Misturæ dimidium*" illustrates the fact that words denoting a part govern the genitive; remember also that adjectives of desire, fear, memory, or knowledge, etc., or the contraries of these, govern the genitive, as "*Timidus febris*." One verb governs another in the infinitive, thus, "*Mistura quam debet capere æger*."

The words "*More solito*," which are so frequently met with in prescriptions, are indicative of the rule

that words expressive of cause, manner, or instrument are put in the ablative.

I have, lastly, to remind you that adverbs of quantity (how much?), time (how long?), and place (where?), govern the genitive, as "*Quantum sufficiat aquæ.*"

We have now rapidly gone over most of the principal rules of syntax, a knowledge of which is necessary for constructing a correct grammatical prescription. I by no means pretend to say that I have given you a complete synopsis of *all* the rules of syntax, but I hope I have sufficiently indicated the more important of these laws. I think that if you will take the pains to master these few precepts you will seldom be at a loss to express yourselves in accordance with the accepted rules of Latin construction.

LESSON II

PARTS OF A PRESCRIPTION

A model prescription consists of four parts, viz. :—

1. *The Superscription*, which simply consists of the letter *R*, a sign which we have learned in our first lesson to regard as an abbreviation of the imperative mood of the verb *Recipio*.

2. *The Inscription*, the names and doses of the substances prescribed.

3. *The Subscription*, the directions to the dispenser.

4. *The Signature*, the instructions for the patient.

The *Superscription* requires no other comment than that which we have already accorded to it, but I have to call your attention to some important points in connection with the *Inscription*.

The ingredients of a typical prescription are supposed to have a representative of the following—

- (a) The *Basis*, or active ingredient.
- (b) The *Adjuvant*, or the auxiliary.
- (c) The *Corrective*.
- (d) The *Vehicle*.

I cannot adduce a better example of the foregoing principles than a commonly-used modification of the Pharmacopœial "black draught," thus—

Superscription . . .	R	
		Magnesii sulphatis, uncias quatuor— <i>Basis</i> .
		Tincturæ sennæ, uncias duas cum semisse— <i>Adjuvant</i> .
Inscription . . .		Tincturæ cardamomi compositæ, drachmas duodecim— <i>Corrective</i> .
		Extracti glycyrrhizæ liquidî, unciam.
		Infusi sennæ, ad uncias viginti quatuor— <i>Vehicle</i> .
Subscription . . .		Misce, fiat mistura.
Signature . . .		{ Cujus capiat æger cochlearia duo magna bis
		terve in horâ, donec adsit catharsis.
	Patient's Name.	Physician's Initials.
	Date.	

Now you are not to suppose that *every* prescription must of necessity have an adjuvant and a corrective as well as a basis and a vehicle. It was the habit of our ancestors to prescribe a multitude of substances with a heroic disregard of compatibility, whether chemical, physical, or therapeutical, in the hope, it is surmised, that some one of the multifarious ingredients would hit off the disease, whatever that might

be. Now, however, the ingredients of a prescription seldom exceed the four forms which I have specified, and oftentimes there are even fewer ingredients than these. Indeed, it is a question whether we are not falling into the opposite extreme, so that, under the pretence of seeking after simplicity, we do not frequently forgo the undoubted advantages of judicious combination. It would be ungenerous to insinuate that "affected simplicity" is sometimes a cloak for gross ignorance. When speaking by and by of the principles of combination I shall have occasion to revert to this subject. I will conclude this brief lesson by asking you, whenever you indite a prescription, to bear in mind the famous precept of Asclepiades, "*Curare cito, tuto, et jucunde.*"

LESSON III

SIGNS AND SYMBOLS

There are certain signs and symbols in everyday use by prescribers with which it is absolutely necessary that you should be thoroughly conversant. They are as follows:—

- grj. = Granum, a grain.
- ʒj. = Scrupulum, a scruple, 20 grains.
- ʒj. = Drachma, a drachm, 3 scruples, or in the case of liquids, 60 minims.
- ʒj. = Uncia, an ounce, 8 drachms.
- ʒj. = Minimum, a minim.
- gttj. = Gutta, a drop.
- Oj. = Octarius, a pint, 20 fluid ounces.
- Cj. = Congius, a gallon, 8 pints.

It will be observed that $\bar{3}j.$ thus signifies $\bar{5}viij.$, whether of solids or liquids, and is thus equivalent to 480 grains or 480 minims as the case may be. This notation is convenient for prescribing, but it leads in the case of solids to a certain ambiguity as regards the ounce. Strictly speaking, $\bar{3}j.$ refers to the Troy ounce; the ounce of the Pharmacopœia is the Avoirdupois ounce of 437.5 grains. When the latter is intended the Pharmacopœial contraction "oz." should be employed.

Although in the British Pharmacopœia of 1864 "all who prescribe and dispense medicines are recommended to discontinue henceforth the use of the drachm and scruple weights," the signs representing these weights have been found so convenient, and have become so familiar to prescribers, that it will be long before the venerable symbols are discarded entirely.

The weights and measures of the British Pharmacopœia, with their symbols, are as follows:—

Weights.

1 pound	.	lb.	= 16 ounces = 7000 grains.
1 ounce (Avoir.)	oz.	.	= 437.5 grains.
1 grain	gr.	.	= 1 grain.

Measures.

1 gallon	.	C.	= 8 pints.
1 pint	.	O.	= 20 fluid ounces.
1 fluid ounce	.	fl. oz.	= 8 fluid drachms.
1 fluid drachm	.	fl. dr.	= 60 minims.
1 minim	.	min.	= 1 minim.

A fluid ounce = the volume at 62° F. of 437.5 gr. of water.

Before we leave this part of our subject I must caution you to study legibility when writing any of

the above signs. You can easily understand that serious errors may result from careless caligraphy—thus a badly-formed ϑ might be mistaken for a 5, and so on. Grave mishaps innumerable have resulted from slovenly writing.

DOMESTIC MEASURES

As a rule, it is inconvenient to give our patients such minute directions as to take "a drachm," for instance, or even "an ounce," of a medicine, and so we not infrequently order them to measure the quantity to be taken in certain utensils in common domestic use. These utensils are accredited with measuring tolerably correct quantities, thus—

Teaspoonful	=	1 fluid drachm.
Dessertspoonful	=	2 fluid drachms.
Tablespoonful	=	4 fluid drachms.
Wineglassful	=	2 to $2\frac{1}{2}$ fluid ounces.
Teacupful	=	6 fluid ounces.
Breakfastcupful	=	10 to 12 fluid ounces.
Tumbler	=	10 to 12 fluid ounces.

These measures can by no means be relied on, and if you are ordering a medicine of which you desire *accurate* quantities to be taken, it would be preferable to adopt the system of using *graduated bottles*.

Perhaps this is the proper place to advert to the practice of prescribing "drops" of a substance. A "drop" is a very indefinite measure indeed, and the idea that it is equal to "about a minim" is in the majority of cases most erroneous; thus, a fluid drachm of distilled water is equivalent to forty-five drops, while a fluid drachm of laudanum will yield one hundred and twenty drops.

THE NUMERAL ADJECTIVES

Under certain circumstances, in prescribing and at examinations, you will be required to write out in unabbreviated Latin the quantities of the drugs or preparations ordered. Perhaps the time will not be lost in refreshing your memories with regard to these numeral adjectives. The following little tabular statement will suffice :—

<i>Unus</i> , one.	<i>Octodecim</i> , eighteen.
<i>Duo</i> , two.	<i>Novendecim</i> , nineteen.
<i>Tres</i> , three.	<i>Viginti</i> , twenty.
<i>Quatuor</i> , four.	<i>Unus et viginti</i> , or } twenty-one.
<i>Quinque</i> , five.	<i>Viginti unus</i>
<i>Sex</i> , six.	<i>Duo et viginti</i> , or } twenty-two.
<i>Septem</i> , seven.	<i>Viginti duo</i>
<i>Octo</i> , eight.	etc.
<i>Novem</i> , nine.	<i>Triginta</i> , thirty.
<i>Decem</i> , ten.	<i>Quadragesima</i> , forty.
<i>Undecim</i> , eleven.	<i>Quinquagesima</i> , fifty.
<i>Duodecim</i> , twelve.	<i>Sexagesima</i> , sixty.
<i>Tredecim</i> , thirteen.	<i>Septuagesima</i> , seventy.
<i>Quatuordecim</i> , fourteen.	<i>Octoginta</i> , eighty.
<i>Quindecim</i> , fifteen.	<i>Nonaginta</i> , ninety.
<i>Sexdecim</i> , sixteen.	<i>Centum</i> , a hundred.
<i>Septendecim</i> , seventeen.	<i>Mille</i> , a thousand.

For the declension of declinable numeral adjectives (*unus*, *duo*, and *tres*) I must refer you to your Latin Grammar.

In conclusion, I must remind you that the Latin numerals are employed in prescribing—thus: i. or j., ij., iv., etc.; “ss.” (*semis*) adds one-half, as iiss. (= 2½); for other fractions Arabic numerals are used.

In the next lesson we will study a list of the terms most frequently employed in prescription-writing, and I will draw your special attention to the contractions or abbreviations of them in vogue among physicians.

LESSON IV

WORDS AND PHRASES MOST FREQUENTLY EMPLOYED,
AND THE ABBREVIATIONS AND CONTRACTIONS OF
THEM

I fear that this lesson will be considered the most uninteresting of the series; but I have to assure you that it is by no means the least important. I have drawn out for you a list of the terms most frequently employed in prescription-writing, and I have indicated in this list the abbreviations of them, which, either from hurry, laziness, or ignorance, prescribers are in the habit of adopting.

WORD OR PHRASE.	CONTRACTION.	MEANING.
Abdomen . . .	Abdom. . .	The belly
Absente febre . . .	Abs. febr. . .	In the absence of fever
Ad defectionem animi . . .	Ad def. animi . . .	To fainting
Ad duas vices . . .	Ad 2 vic. . .	At twice taking
Ad libitum . . .	Ad lib. . .	At pleasure
Ad tertiam vicem . . .	Ad 3tiam vicem . . .	For three times
Adde, addantur, addendus, addendo	Add. . .	Add, let be added, to be added, by adding
Admove, admoveatur, admoveantur	Admov. . .	Apply, let it be applied, let them be applied
Adstante febre . . .	Adst. febre . . .	When the fever is on
Adversum . . .	Adv. . .	Against
Æger, ægra . . .	Æg. . .	The patient
Aggrediente febre . . .	Aggred. febre . . .	While the fever is coming on

WORD OR PHRASE.	CONTRACTION.	MEANING.
Aliquot . . . . .	. . . . .	Some
Alternis horis . . .	Alt. hor.	Every other hour
Amplus . . . . .	. . . . .	Large
Ana	A, āā	Of each
Aqua—astricta, bul- liens, communis, fervens, fluviatilis, fontalis (or fontana, or fontis), marina, nivalis, pluviatilis, (or pluvialis)	Aq. astr., bull., com., ferv., fluv., font., mar., niv., pluv.	Water—frozen, boil- ing, common, hot, river, spring, sea, snow, rain
Aut . . . . .	. . . . .	Or
Balneum marie or maris	B. M.	A warm-water bath
Balneum vaporosum or vaporis	B. V.	A vapour bath
Bene . . . . .	. . . . .	Well
Bibe	Bib.	Drink (thou)
Biduum . . . . .	. . . . .	Two days
Bis indies	Bis ind.	Twice a day
Bolus	Bol.	A large pill
Bulliat, bulliant . .	Bull.	Let boil
Calefactus . . . . .	. . . . .	Warmed
Capiat	Cap.	Let the patient take
Cibus, cibi . . . . .	. . . . .	Food
Cochlear or coch- leare, cochleatim	Coch., cochleat. . .	A spoonful, by spoon- fuls
Cochleare amplum, magnum, medium or modicum, par- vum	Coch. amp., coch. mag., coch. med., coch. mod., coch. parv.	A tablespoonful, a large spoonful, a dessertspoonful, a teaspoonful
Coctio . . . . .	. . . . .	Boiling
Cola, colatus, cole- tur, colentur	Col., colat., colet., colent.	Strain, strained, let it be strained, let them be strained
Collutorium	Collut.	A mouth-wash
Collyrium	Coll.	An eye-wash
Compositus	Comp., co.	Compounded
Congius	Cong.	A gallon
Conserva	Cons.	A conserve; also keep (thou)

WORD OR PHRASE.	CONTRACTION.	MEANING.
Continuantur remedia	Cont. rem. . . .	Let the medicines be continued
Coque, coquantur .	Coq.	Boil, let them be boiled
Cortex	Cort.	Bark
Cras, crastinus . .	Cras. crast. . . .	Early, for to-morrow
Cujus, ejuslibet . .	Cuj.	Of which, of any
Cum	C, c.	With
Cyathus or cyathus vinarius	Cyath., cy. vinar .	A wine-glass
Da, detur	Da, det.	Give, let be given
De . . . . .	. . . . .	Of, or from
Debita spissitudo .	Deb. spiss. . . .	Of proper consistence
Decanta	Dec.	Pour off
Decoctum	Decoet.	A decoction
Decubitus	Decub.	Lying down
De die in diem . . .	De d. in d. . . .	From day to day
Deglutiatur	Deglüt.	May or let be swallowed
Dejectiones alvi . .	Dej. alv.	Stools
Diebus alternis . . .	Dieb. alt.	Every other day
Diluculo	Diluc.	At break of day
Dilue, dilutus . . .	Dil.	Dilute (thou), diluted
Dimidius	Dim.	One-half
Directione propriâ .	D. P. or direc. prop.	With a proper direction
Dividatur in partes æquales	D. in p. æq. . . .	Let it be divided into equal parts
Dolor . . . . .	. . . . .	Pain
Donec . . . . .	. . . . .	Until
Dosis	D.	A dose
Durante dolore . . .	. . . . .	While the pain lasts
Edulcoratus	Ed.	Sweetened
Ejusdem	EjUSD.	Of the same
Electuarium	Elect.	An electuary
Emesis . . . . .	. . . . .	Vomiting
Enema	En.	An enema
Evanuerit	Evan.	Shall have disappeared
Exhibeatur	Exhib.	Let it be exhibited

WORD OR PHRASE.	CONTRACTION.	MEANING.
Extende super alutem mollem	Ext. sup. alut. moll.	Spread thou upon soft leather
Extractum . . .	Extr. . . .	An extract
Fac, fiat, fiant . . .	F. ft. . . .	Make, let it be made, let them be made
Febris . . . .	. . . .	Fever
Fervens	Ferv. . . .	Boiling
Fiat lege artis . . .	F. L. A. . . .	Let it be made by the rules of art
Fiat secundum artis regulas	F. S. A. R. . .	Let it be made according to the rules of the art
Filtram, filtra . . .	Filt. . . .	A filter, filter (thou)
Fluidus	Fl. . . .	Liquid
Frustillatim	Frust. . . .	In little pieces
Gargarisma	Garg. . . .	A gargle
Gradatim . . . .	. . . .	By degrees
Gratus . . . .	. . . .	Pleasant
Gutta	Gtt. . . .	A drop
Guttatim	Guttat. . . .	By drops
Guttis quibusdam . .	Gutt. quibusd.	With a few drops
Haustus	Haust. . . .	A draught
Hebdomada . . . .	. . . .	A week
Heri . . . .	. . . .	Yesterday
Hic, hæc, hoc . . . .	. . . .	This
Hirudo . . . .	. . . .	A leech
Hora, horâ somni . .	H., hor. som.	An hour, bedtime
Horis intermediis . .	Hor. interm.	In the intermediate hours
Idem	Id. . . .	The same
Imprimis . . . .	. . . .	First
Incide, incisus . . .	Inc. . . .	Cut (thou), being cut
Indies	In d. . . .	From day to day, daily
Infricandum	Infric. . . .	To be rubbed in
Infunde	Inf. . . .	Pour in
Infusum	Infus. . . .	An infusion
Injectio	Inj. . . .	An injection
Instar . . . .	. . . .	As big as
Inter . . . .	. . . .	Between
Internus . . . .	. . . .	Inner

WORD OR PHRASE.	CONTRACTION.	MEANING.
Jam . . . . .	. . . . .	Now
Julepus, julepum, julapium	Jul.	A julep
Juxta . . . . .	. . . . .	Near to
Lac . . . . .	. . . . .	Milk
Lana . . . . .	. . . . .	Flannel
Languor . . . . .	. . . . .	Faintness
Lateri dolenti	Lat. dol.	To the painful side
Lectus . . . . .	. . . . .	A bed
Linctus . . . . .	. . . . .	A cough-mixture
Linimentum	Liniment.	A liniment
Linteam . . . . .	. . . . .	Lint
Liquor	Liq.	A solution
Lotio . . . . .	. . . . .	A lotion
Magnus	Mag.	Large
Mane, mane primo . . . . .	. . . . .	In the morning, very early in the morning
Manipulus	M. or man.	A handful
Manus . . . . .	. . . . .	The hand
Massa, massa pilularis	M., m. p.	A mass, a pill-mass
Matutinus . . . . .	. . . . .	In the morning
Medius . . . . .	. . . . .	Middle
Mensura . . . . .	. . . . .	By measure
Micra panis	Mic. pan.	Crumb of bread
Minimum	M. or min.	A minim
Minutum . . . . .	. . . . .	A minute
Misce	M.	Mix
Mistura	Mist.	A mixture
Mitte mittatur, mittantur	. . . . .	Send, let it be sent, let them be sent
Modicus . . . . .	. . . . .	Middle-sized
Modo præscripto	Mod. præsc.	In the manner prescribed
Mora . . . . .	. . . . .	Delay
More dietu, more solito	More dict., more sol.	In the manner directed, in the usual manner
Mortarium . . . . .	. . . . .	A mortar
Necnon . . . . .	. . . . .	Also
Nisi . . . . .	. . . . .	Unless

WORD OR PHRASE.	CONTRACTION.	MEANING.
Nox, noctis . . . . .	. . . . .	Night
Nucha . . . . .	. . . . .	The nape of the neck
Numerus	No.	Number
Octavus . . . . .	. . . . .	Eighth
Omni hora, omni bi- horio, omni quad- rante horæ	Omni. hor., omni. bih., omni. quadr. hor.	Every hour, every two hours, every quarter of an hour
Opus . . . . .	. . . . .	Need or occasion
Pars . . . . .	. . . . .	A part
Partes æquales	P. æ.	Equal parts
Partibus affectis	Part. aff., p. a.	To the affected parts
Parvus . . . . .	. . . . .	Little
Pediluvium . . . . .	. . . . .	A foot bath
Pilula . . . . .	. . . . .	A pill
Poculum, pocillum	Pocul., pocill.	A cup, a little cup
Pondere	P.	By weight
Potus . . . . .	. . . . .	Drink
Primus . . . . .	. . . . .	First
Pro ratione ætatis	P. rat. æt.	According to the age of the patient
Pro re natâ	P. r. n.	Occasionally
Pulvis (<i>masc.</i>)	Pulv.	A powder
Purus, a, um	Pur.	Pure
Quantum lubet, or quantum placet, or quantum vis	Q. l., q. p., q.	As much as you please
Quantum sufficiat, or quantum satis	Q. s.	As much as is suffi- cient
Quâquâ horâ . . . . .	. . . . .	Each hour
Quartus . . . . .	. . . . .	Fourth
Quintus . . . . .	. . . . .	Fifth
Quorum	Quor.	Of which
Ratio . . . . .	. . . . .	Proportion
Recens	Rec.	Fresh
Redactus in pulver- em, redigatur in pulverem	Red. in pulv., re- dig. in pulv.	Let it be reduced to powder
Reliquus . . . . .	. . . . .	Remaining
Repetatur, repetan- tur	Repet., pt.	Let it be repeated, let them be repeated
Saltem . . . . .	. . . . .	At least

WORD OR PHRASE.	CONTRACTION.	MEANING.
Scatula	Scat.	A box
Secundum artem, secundum naturam	S. A., S. N	According to art, according to nature
Secundus . . . . .	. . . . .	Second
Semel . . . . .	. . . . .	Once
Semis	Ss.	A half
Septimana . . . . .	. . . . .	A week
Sesquihora	Sesquih.	An hour and a half
Sesuncia	Sesunc.	An ounce and a half
Sextus . . . . .	. . . . .	Sixth
Si . . . . .	. . . . .	If
Simul . . . . .	. . . . .	Together
Sine . . . . .	. . . . .	Without
Singulorum	Sing.	Of each
Si non valeat	Si n. val.	If it does not answer
Si opus sit	Si op. sit, s. o. s. . . .	If necessary
Si vires permittant	Si vir. perm.	If the strength will bear it
Sit . . . . .	. . . . .	Let it be
Solus . . . . .	. . . . .	Alone
Solvo, solvere, solutus	. . . . .	To dissolve, dissolved
Somnus . . . . .	. . . . .	Sleep
Statim	Stat.	Immediately
Stet, stent	St.	Let it stand, let them stand
Subactus . . . . .	. . . . .	Subdued
Subinde . . . . .	. . . . .	Frequently
Sume, sumat, sumatur, sumantur, sumendus	Sum.	Take (thou), let him take, let it be taken, let them be taken, to be taken
Supra . . . . .	. . . . .	Above
Tabella	Tabel.	A lozenge
Talis . . . . .	. . . . .	Such a one
Tenipus . . . . .	. . . . .	Time or temple
Tero, tere . . . . .	. . . . .	To rub, rub (thou)
Ter indies	T. i. d.	Thrice daily
Tinctura	Tinct. or tra.	A tincture
Triduum . . . . .	. . . . .	Three days
Tritura	Trit.	Triturate

It not infrequently happens that
productive of direful errors, and there
stances to which I will now ask you
If you desired to prescribe a
you might possibly write "a
abbreviation which would equally sta
cyanicum, and grave conse
such a reading. Again, in w
the x should be perfectly
might be mistaken for a *pro*
cardinal, the writing colchicum or
the abbreviation "col," for the
can be left in doubt as to which d
I have seen several prescriptions
"hydrargyrum, hydras, hydrad
hydrargyrum. The
might be intended for the *hydrad*

	MEANING
A. S. S.	A box
	According to art. ac-
	According to nature
	Second
	Once
	A half
	A week
	An hour and a half
	An ounce and a half
	Sixth
	If
	Together
	Without
	Of each
	If it does not answer
	If necessary
	If the strength will
	bear it
	Let it be
	Alone
	To dissolve, dissolved
	Sleep
	Immediately
	Let it stand, let them
	stand
	Subdued
	Frequently
	Take (thou), let him
	take, let it be taken,
	let them be taken,
	to be taken
	Above
	A lozenge
	Such a one
	Time or tempo
	To rub, rub
	Three daily
	A uncture
	Three days
	Triturate

PRESCRIPTIONS

WORD OR PHRASE.	CONTRACTION.	MEANING.
Trochisci . . .	Troc. . .	Lozenges
Tussis . . .	. . .	A cough
Ultima præscripta . . .	Ult. præsc. . .	The last ordered
Una . . .	. . .	Together
Utor . . .	. . .	To make use of
Vas vitrium . . .	. . .	A glass vessel
Vehiculum . . .	. . .	A vehicle
Ventriculo vacuo . . .	Vent. vac. . .	On an empty stomach
Verum . . .	Ver. . .	Genuine
Vesper . . .	Vesp. . .	The evening
Vices . . .	. . .	Turns, or times
Vitellus . . .	. . .	Yolk
Vitrium . . .	. . .	Glass
Vomitone urgente . . .	Vom. urg. . .	The vomiting being troublesome

It not infrequently happens that abbreviations are productive of direful errors, and there are some special instances to which I will now ask your careful attention. If you desired to prescribe acidum hydrochloricum, you might possibly write "*acid. hydroc.*"—an abbreviation which would equally stand for acidum hydrocyanicum, and grave consequences might ensue from such a reading. Again, in writing the words *aqua fontis*, the *n* should be perfectly legible, lest the words might be mistaken for *aqua fortis*. You should be careful when writing colchicum or colocynth not to use the abbreviation "*col.*" for the dispenser would then be left in doubt as to which drug was intended. I have seen several prescriptions in which the contraction "*hydr.*" occurred—a word which might mean either hydrargyrum, hydras, hydriodas, hydrochloricum, or hydrocyanicum. The abbreviation "*hydr. bic.*" might be intended for the bichloride or bicyanide of

mercury, and "*hydr. bin.*" would equally signify the biniodide or the binoxide of that metal. The words "*hyd. chlor.*," which were written for hydrate of chloral, have been taken to indicate corrosive sublimate.

The foregoing are some of the more important instances of the errors which might ensue from the careless or injudicious use of abbreviations. I trust that they will demonstrate forcibly the necessity of carefully considering the significance which *might* be attributed to every abbreviation you make use of.

LESSON V

THE PRINCIPLES OF MEDICINAL COMBINATION

In the year 1822 Dr. John Ayrton Paris published his *Pharmacologia*, many copies of which can yet be had. In this work the principles of medicinal combination have been treated in so exhaustive and masterly a style that no subsequent writer has found much room for improvement. I shall not attempt originality, therefore, in this lesson, but will endeavour as briefly, but as faithfully as possible, to give you the pith of Dr. Paris's teachings. I should, however, advise you to endeavour to procure for yourselves a copy of this work, which is as intelligible to the junior student as it is pregnant with interest to the veteran practitioner, every page of it teeming with fact, observation, and suggestion.

The objects which we seek to obtain by combining medicines are fourfold :—

1st. To augment, correct, or modify the action of a medicine.

2nd. To obtain the joint operation of two or more medicines.

3rd. To obtain a new remedy.

4th. To afford a suitable form.

These objects we shall consider *seriatim*.

I. TO AUGMENT, CORRECT, OR MODIFY THE ACTION OF A MEDICINE

We can AUGMENT the action of a medicine *by combining different preparations of it*, as, for instance, when the infusion and tincture of the same substance are ordered, a combination which is indicated when all the active principles are not soluble in the same vehicle. Another means of increasing the action of a substance is *by combining with it substances which produce similar effects*. To Dr. Fordyce we are indebted for the enunciation of the law that “combination of similar remedies will produce a more certain, speedy, and considerable effect than an equivalent dose of any single one.” Neither ipecacuanha nor tartar emetic alone are so certain as a mixture of the two when we desire to produce emesis. Every class of therapeutic agents affords numerous examples of the truth of this law. I trust that I have only to mention that the subject offers a wide field for original research to stimulate you to seek out for yourselves fresh illustrations of the law of Fordyce. A third and last

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mode of increasing the action of a medicine is *by combining with it substances of a different nature which can in some unknown manner enhance its action*. The diuretic effect of squill is increased by a mercurial; ipecacuanha assists the purgative action of jalap; and opium renders more certain the action of mercury. Other examples innumerable might be quoted as afforded by both official and magistral formulæ.

We can CORRECT or MODIFY the action of a medicine *by chemically neutralising, or mechanically separating, the offending ingredient, or by combining with it some substance capable of protecting the stomach or system against its injurious effects*. Thus, we correct the griping tendency of purgatives by combining with them aromatics or essential oils; the drastic properties of colocynth may be obviated by admixture with camphor. The griping of senna and resinous purgatives may be prevented by alkaline salts; and several substances can be deprived of acrimony by trituration with mucilage, barley-water, or milk, as exemplified by the *mistura scammonii* of the old Pharmacopœia. Again, the tendency of mercurials to affect the bowels may be corrected by opium, while the constipating effects of the latter drug may be best combated by combination with aloes.

II. TO OBTAIN THE CO-OPERATION OF TWO OR MORE MEDICINES

This we do *by combining substances which have a different mode of action, and which effect the same or different results*. As an example of a combination of

substances which effect the same ends by different means we may instance the admixture of purgatives, some of which act by increasing the peristaltic action of the intestines, others by increasing the intestinal mucous secretion ; and others by increasing the secretion of the neighbouring organs. It would be useless to cite here instances of the combination of medicines having different actions, and *intended to obviate different symptoms*. In future lessons we shall have frequent opportunities of studying examples in detail. I will, however, bid you beware of falling into the habit of prescribing for *symptoms only* instead of for the *causes* which produce them. It is said of an eminent physician, formerly resident in Dublin, that when writing a prescription he used to give a remedy for each symptom as recounted by the patient. I have seen some few formulæ emanating from this gentleman, and really it is difficult to conceive how such marvellously incongruous compositions could otherwise have been indited. I am unable to say absolutely what the effects of such mixtures were upon the patient, but unless all the laws of medicinal combination were subverted in favour of this practitioner and his clients, I should say that they must have been worse than useless. Above all things, be on your guard against falling into the error of prescribing substances which possess essentially *opposite therapeutic properties and which are medicinally inconsistent or physiologically incompatible*: none of you, I trust, would prescribe prussic acid with strychnine ; it was the lot of Dr. Paris to behold a prescription in which these were the principal ingredients.

III. TO OBTAIN A NEW REMEDY NOT AFFORDED BY
ANY SINGLE SUBSTANCE

By combining medicines which possess different properties, and which by their union produce effects not exerted by either separately and not attributable to chemical action. The official pulvis ipecacuanhæ compositus will serve as an illustration. This preparation is remarkable for its diaphoretic properties, whilst neither of its ingredients, opium nor ipecacuanha, when taken separately, exerts any powerful action on the skin. The development of this property by the union of these substances is inexplicable on the ground of chemical reaction. We *can*, however, produce new remedies by combining substances which are capable of reacting chemically on each other. My namesake's mixture, the mistura ferri composita of the Pharmacopœia, is a good example; in this preparation ferrous sulphate and potassium carbonate are employed, and these reacting on each other form ferrous carbonate and potassium sulphate.

IV. TO AFFORD A SUITABLE FORM

It is not the least of the duties of the prescriber to order his remedy in a convenient and agreeable as well as in an efficacious form. When writing a prescription always have regard to the taste, appearance, consistence, equable mixture, and preservation of the medicine. While it is thus our duty, as far as possible, to consult the tastes, and even the caprices of our patients, we must never consent to sacrifice the

efficacy of a medicine to its taste or appearance. It would seem to be necessary thus to admonish you, for Dr. Paris has known medical men who, if they considered it needful to recommend a shower-bath, would suggest that the disagreeable sensations occasioned thereby might be obviated by an umbrella.

In this lesson I have purposely avoided giving more than one or two illustrations of the laws of combination, inasmuch as in future lessons we shall have frequent opportunities of studying further exemplifications of them.

LESSON VI

INCOMPATIBILITY

Substances are said to be incompatible when their combination gives rise to chemical changes, a new compound being formed which is either inert or possessed of distinct properties. Chemical incompatibility, however, does not always signify therapeutical inertness. Substances which are chemically incompatible are sometimes intentionally combined in order to obtain a new compound; as, for instance, in the official *mistura ferri composita*, where a decomposition occurs between the ferrous sulphate and the potassium carbonate.

The subject of incompatibility is, as Parrish says, "too much of a stumbling-block to the student." The older text-books of *materia medica* contained a long list of so-called incompatibles, which the unfortunate

student was expected to commit to his already overburdened memory. It is now known that many of these "incompatibles" are not incompatible at all, and that many of them might be excluded from the list from the extreme unlikelihood of any one ever prescribing them together.

Incompatibility may be threefold, viz.

1. Chemical.
2. Pharmaceutical.
3. Physiological and therapeutical.

We have given above the signification of *chemical* incompatibility. By *pharmaceutical* incompatibility we mean combination of such substances as are physically incapable of mixing; thus, if spirit of nitrous ether be added to a tincture of guaiacum a gelatinous mass will result, or if resinous tinctures be added to aqueous solutions the resins will separate. The following are some of the more striking examples of pharmaceutical incompatibles, and they should be carefully remembered by the prescriber—

Acid infusion of cinchona with compound infusion of gentian.

Infusions generally with metallic salts.

Most tinctures made with strong alcohol, with those made with weak alcohol, and with infusions and aqueous liquids, unless an excipient is used.

Essential oils with aqueous liquids in amounts exceeding one minim to one fluid ounce.

Fixed oils and copaiba with aqueous liquids, except with excipients.

In our last lesson we alluded to the subject of *physiological* or *therapeutical* incompatibility. By this term we imply combination of such substances as

possess opposite therapeutical and physiological properties, and which are medicinally inconsistent: for instance, belladonna would be physiologically incompatible with Calabar bean.

I will now ask your attention to the following simple rules, a knowledge of which will be sufficient to guard you from the commission of any flagrant errors in the matter of chemical incompatibility.

LAWS OF CHEMICAL INCOMPATIBILITY

1. Two salts in solution may form, by the interchange of their acids and bases, two insoluble salts which are precipitated.

2. When two salts in solution form, by the interchange of their acids and bases, a soluble and an insoluble salt, the latter will generally be precipitated, or may form with the soluble salt a double salt.

I have before me two clear solutions, one of barium chloride, the other of sodium sulphate. As I mix them you observe the formation of a copious precipitate; this is insoluble barium sulphate. If we now filter off the clear fluid we shall find it to be a solution of sodium chloride.

3. When two salts in solution do not give rise to an insoluble salt no precipitate will result, though there may be decomposition.

4. An acid will decompose a salt—

(a) If the acid added be more fixed or more soluble than that of the salt.

(b) If the acid added can form an insoluble or a less soluble compound with the base of the salt.

(c) If the acid added possesses a greater affinity for the base of the salt.

(d) If the acid of the salt be gaseous.

I have in one vessel dilute sulphuric acid, and in another vessel I have some liquor ammonii acetatis. You observe that, as I mix them, acetic acid is given off, and the liquid on examination will prove to contain ammonium sulphate.

5. Oxides of the alkalies decompose salts of the metals proper and of the alkaloids, and precipitate their bases, or the base may be soluble in excess of the alkali.

Here is a solution of zinc sulphate; as I add to it a little liquor potassæ, you see the formation of a precipitate of zinc oxide; as I add more of the liquor potassæ the precipitate becomes dissolved.

6. Metallic oxides combine with acids to form salts.

7. Vegetable substances containing tannic or gallic acids precipitate albumen, vegetable alkaloids, and most of the metallic oxides, and form with salts of iron inky solutions. Substances containing tannic acid also precipitate gelatin.

8. Many glucosides are incompatible with free acids or emulsions.

As a general rule the following substances should be prescribed alone, and are best given in simple solution—

Acid. hydrocyanic. dil.	Liq. arsenicalis.
Acid. nitro-hydrochlor. dil.	Liq. ferri pernit.
Antim. tart.	Tinct. ferri perchlor.
Liq. calcis.	Tinct. iodi.
Liq. potassæ.	Potassii bromid.

Potassii iodid.	Morphinæ acetat.
Potassii permanganas.	Morphinæ hydrochlor.
Potassii acetat.	Quininæ sulphat.
Zinci acetat.	Phenazonum.

I now propose to pass in review some of the more important instances of individual incompatibility, but in this survey I shall generally omit instances bearing on the rules we have above enunciated.

ACID. HYDROCYANIC. DIL.—This is not infrequently prescribed with alkalies; a cyanide of the metal is thus formed, which is not less active than the acid itself.

ACID. PHOSPH. DIL. may be prescribed with syrup of ferrous phosphate; if, however, it be combined with syrup of *pyrophosphate* of iron the mixture becomes solid.

ACID. SULPH. DIL.—The rules which I have above given will obviate the necessity of enumerating the long list of substances with which this acid is incompatible. There is one combination, however, which I must warn you to avoid. Sulphuric acid is, as you are aware, very efficacious in cases of internal hæmorrhage, and so are the lead salts; we may not, however, combine these agents, as an insoluble lead sulphate would result.

ACID. NITRIC. DIL.—Dr. Paris writes that he has seen a formula in which “a tincture of opium was directed to be prepared with rectified spirit, and mixed with undiluted nitric acid! In this case it may very safely be inferred that its author was not only ignorant of the chemical habitudes of those bodies, but that he was, moreover, guiltless of ever having perpetrated the act in question, or he would

Liq. arsenicalis.
Liq. ferri perchlor.
Tinct. ferri perchlor.
Tinct. ii.
Potassii bromid.

undoubtedly have found that, in consequence of the mutual action of these ingredients, *hyponitrous ether* is rapidly produced, and it is probable that the phial and its corrosive contents would have exploded, to the imminent hazard of the operator's eyes."

ACID. TANNIC. may be prescribed with ferrous salts, but not with ferric salts. Galls and tannic and gallic acids are said to be incompatible with infusions and decoctions containing alkaloids, but tannates of alkaloids are by no means inert; morphine tannate will induce sleep, and emetine tannate will cause vomiting. Tannic acid is also incompatible with gelatin and with many metallic substances.

ACID. TARTARIC.—This acid was formerly much used in making saline draughts. Now, if potassium bicarbonate be added to a solution of tartaric acid, acid potassium tartrate is thus formed, and at once precipitated; but if the tartaric acid be added to the potassium salt no such untoward circumstance will occur.

ALUM is incompatible with alkalies and their carbonates, with tannic acid and preparations containing it, with tartrates, salts of lead, calcium, and barium, etc.

ANTIM. TART.—Acids, alkalies, and alkaline carbonates, and some earthy and metallic preparations, cause precipitates with tartar emetic, but these precipitates are soluble in excess of caustic alkalies. If tartar emetic be combined with astringent vegetable infusions an insoluble antimony tannate will result. I may here mention that tartar emetic is often, and with perfect propriety, prescribed with magnesium sulphate.

ARGENTI NITRAS.—It is almost unnecessary for me to remind you that this salt should not be dissolved in undistilled water or in vegetable infusions.

ARGENTI OXIDUM.—This substance is incompatible with many organic substances. On account of its influence on the mucous membrane of the stomach, it might possibly occur to a practitioner that it would be a valuable addition to creasote in certain cases of vomiting. The result of such a combination would be spontaneous combustion.

FERRI ET AMMONII CITRAS.—This salt is sometimes prescribed in effervescence. In such a case the iron salt must be put into the citric acid solution, and not into that of the potassium bicarbonate; if the latter course were adopted carbonic acid would be given off, with the probable effect of bursting the bottle. This salt is often prescribed with tincture of orange alone; it will be well to remember that unless *some* water be added it will be insoluble in this menstruum.

FERRUM TARTARATUM may be prescribed with alkaline carbonates.

HYDRARGYRI PERCHLORIDUM is incompatible with vegetable preparations containing albumen or tannin. It is precipitated by alkalies, alkaline sulphides, iodides, tartar emetic, etc.; in fact, there is hardly anything with which it is advisable to combine corrosive sublimate except ammonium chloride, which increases its solubility. Liquor hydrargyri perchloridum may with perfect propriety be prescribed with potassium iodide: the precipitate redissolves in a little excess of either salt.

HYDRARGYRI SUBCHLORIDUM.—You should be

X very careful not to order calomel in combination with
any preparation containing a trace of prussic acid. X
 Innocuous as calomel itself is, comparatively speaking, it is converted by prussic acid into mercuric chloride and cyanide, two virulent poisons.

MAGNESII SULPHAS.—I have seen a prescription in which Epsom salts was ordered with calcined magnesia and colchicum wine; the result of such a combination would be an insoluble bulky mass.

PLUMBI ACETAS is incompatible with nearly everything except solid opium and distilled water. If common (hard) water be added to liquor plumbi subacetatis dilutus, lead carbonate and sulphate will be thrown down.

POTASSII IODIDUM should not be prescribed with sweet spirit of nitre, acid preparations, or those containing starch. In fact, iodine and iodides should be prescribed with as few additions as possible. Potassium iodide decomposes nearly all metallic salts.

CALUMBA.—When we desire to combine salts of iron with a vegetable tonic, calumba may be chosen, as it contains no tannic or gallic acid.

CAMPHORA forms soft masses with gum resins. It destroys the odour of musk.

CARYOPHYLLUM.—Cloves contain tannin, and hence should not be prescribed with iron salts.

TINCT. CASCARILLÆ.—This preparation is not unfrequently prescribed with dilute mineral acids: the combination is, however, objectionable, as floccules soon float through the mixture. If it is desirable to combine an acid with cascarrilla the infusion of that drug should be selected.

TINCT. CANNABIS INDICÆ.—If this or other

spirituous solutions of resinous substances be added to water, the resin will be precipitated, unless mucilage be added in order to suspend it.

CHLOROFORM will not remain mixed with weak alcohol or with glycerin.

BELLADONNA, HYOSCYAMUS, and STRAMONIUM.—

It has long been known that caustic fixed alkalies decompose the alkaloids of these agents. Runge demonstrated the fact long ago, although one recent author must have been ignorant of this, for he writes as if he claimed the discovery for himself. Carbonates and bicarbonates of the alkalies may be prescribed with preparations of these drugs.

OPIUM.—The older text-books contained a long list of substances which were supposed to be incompatible with opium; most of these are not now considered as improper combinations. Tincture of opium is not infrequently prescribed with lead acetate; a decomposition takes place resulting in the formation of morphine acetate and insoluble lead meconate.

QUININÆ SULPHAS is often prescribed in combination with an infusion of roses, and a turbid and unsightly mixture results.

I will conclude the subject of incompatibility by reminding you that we are not always to infer that because a substance is insoluble in water, it is necessarily therapeutically inactive. Such substances may oftentimes be so operated upon in the laboratory of the human economy as to become essentially active and potent.

LESSON VII

POSODOLOGY

We have to-day to consider the extremely important subject of dosage. It is very necessary for you at the outset to understand that a medicine will exert a very different effect according to the dose administered; thus, tartar emetic in doses of from 1-24th to 1-8th of a grain acts as a diaphoretic; in doses of from 1-8th to half a grain, when tolerance is established, it will act as a depressant; and in doses of from one to two grains it will produce emesis.

There is one matter of great interest and importance connected with posology to which sufficient attention is not paid by the generality of practitioners—I allude to the modification of action exercised by a medicinal agent according as it is administered in one large dose or in several small doses at stated intervals. We have yet much to learn concerning this matter, and the subject opens up for you a wide field for original investigation. One of the most pungent writers in one of the most incisive articles which ever issued from his pen thus expresses himself: "No greater service could be performed by the colleges or the great medical societies than the formation of a committee of competent men for the special investigation of this question of dosage: for it is a subject which is as yet only in its infancy, and the best knowledge which exists about it is undoubtedly confined to a very small section of the medical profession."

I propose in this lesson to give a summary of the

subject of posology, in the hope of facilitating a knowledge of official dosage sufficient for the exigencies of ordinary practice. I use the term "official dosage" advisedly, for the posological dicta of the British Pharmacopœia are only "intended to represent the average range, in ordinary cases, for adults. They are meant for general guidance, but are not authoritatively enjoined." The prescriber of experience will in many cases order doses which are beyond the limits of the official range. For instance, in the Pharmacopœia the largest dose of tincture of digitalis which is mentioned is fifteen minims, whereas half an ounce is not infrequently given in delirium tremens. A fluid drachm is the maximum dose indicated for tincture of henbane, but half an ounce of that preparation is often given with benefit to maniacal patients. The minimum dose stated for tincture of belladonna is five minims, and the maximum dose is fifteen, but smaller and larger doses may often be given with advantage. Two fluid drachms are mentioned as the maximum dose of succus conii, but I have myself seen an ounce of that preparation administered with great benefit. The Pharmacopœia specifies ten grains as the largest ordinary dose of quinine sulphate, a dose which would be inadequate in many cases of intermittent fever, etc. Again, even the smallest dose indicated for strychnine and the salts of morphine is much too large for certain cases.

In 1873 the late Dr. Anstie directed the attention of the profession to the defects then apparent in our "official dosage,"¹ and though great improvement has been effected in the Pharmacopœia of 1898,

¹ *Practitioner*, vol. ix. p. 259; 1873.

to consider the extremely im-
portance of dosage. It is very necessary for
the student to understand that a medicine will
produce a different effect according to the dose
given; thus, tartar emetic in doses of from
1/4 to 1/2 of a grain acts as a diaphoretic; in
doses of 1/2 to 1 grain, when tolerance is
lost, it will act as a depressant; and in doses
of 1 to 2 grains it will produce emesis.
This is a matter of great interest and import-
ance, and with posology to which sufficient attention
is not paid by the generality of practitioners—I allude
to the action exercised by a medicinal
agent as it is administered in one large dose
or in small doses at stated intervals. We have
often seen concerning this matter, and the sub-
ject is a wide field for original investi-
gation. One of the most pungent writers in one of
our journals has said: "No greater service could
be rendered to the colleges or the great medical
schools than by the formation of a committee of compe-
tent men to make a special investigation of this question."
It is a subject which is as yet only in
its infancy, and the best knowledge which exists about
it is confined to a very small section of
the profession.
In this lesson to give a summary of the

something remains to be done. You will understand, therefore, that although in apportioning doses I have generally followed the new British Pharmacopœia as an authority, I do not always adhere to the limits given in that volume. The doses which I am about to give are those for adults, so that I will ask your attention to the methods of Gaubius and Young for regulating doses according to age.

GAUBIUS'S METHOD OF REGULATING DOSES ACCORDING TO AGE

Ages.	Proportional Quantities.	Doses.
<i>For an Adult</i>	<i>suppose the dose to be 1</i>	<i>or 60 grains.</i>
Under 1 year .	will require . . . $\frac{1}{12}$	5 "
" 2 years .	" . . . $\frac{1}{8}$	7½ "
" 3 " .	" . . . $\frac{1}{6}$	10 "
" 4 " .	" . . . $\frac{1}{4}$	15 "
" 7 " .	" . . . $\frac{1}{3}$	20 "
" 14 " .	" . . . $\frac{1}{2}$	30 "
" 20 " .	" . . . $\frac{2}{3}$	40 "
Above 21 " .	the full dose . . . —	60 "
" 65 " .	the inverse gradation of the above	

YOUNG'S RULE FOR REGULATING DOSES ACCORDING TO AGE

"For children under twelve the doses of most medicines must be diminished in the proportion of the age to the age increased by 12." Thus—

YOUNG'S METHOD OF REGULATING DOSES ACCORDING TO AGE

For one year, $\frac{1}{1+12} = \frac{1}{13}$	For four years, $\frac{4}{4+12} = \frac{1}{4}$
For two years, $\frac{2}{2+12} = \frac{1}{7}$	For six years, $\frac{6}{6+12} = \frac{1}{3}$
For three years, $\frac{3}{3+12} = \frac{1}{5}$	etc. etc.

Not only must *age* be taken into consideration in apportioning a dose, but *sex, habit, temperament, idiosyncrasy, disease, race, and climate* must all receive due consideration. It is unnecessary for me to do more than remind you that certain drugs, such as opium, are very badly borne by children.

In the following posological summary I will adopt a classification based on the nature and source of the drugs in question.

INORGANIC SUBSTANCES

NON-METALLIC ELEMENTS

Carbo ligni	3j.—ij.
Sulphur sublimat.	} gr. xx.—3j.
„ præcipitat.	
Phosphorus	gr. i-100th—i-20th.

ACIDS

Dilute acids, average dose ℥v.—xx., *except acid. hydrocyanic. dil., the dose of which is ℥ii.—vi., and acid. acetic. dil., the dose of which is 3ss.—3ij.*

The dose of acid. sulph. aromat. is the same as that of the dilute acid (℥v.—xx.)

The dose of acid. hydrobrom. dil. is ℥xv.—3j.

The dose of acid. sulphurosum is ℥xxx.—3j.

The following are the doses of the *solid* acids—

Acid. Arseniosum	gr. 1-60th—1-15th.
„ Carbolicum	gr. i.—iii.
„ Tannicum	gr. ii.—v.
„ Benzoicum	} gr. v.—xv.
„ Boricum	
„ Gallicum	
„ Citricum	} gr. v.—xx.
„ Tartaricum	
„ Salicylicum	

SALTS OF THE ALKALIES

Ammonium.—The dose of the benzoate is gr. v.—xv.; of the chloride and phosphate is gr. v.—xx.; of the bromide is gr. v.—xxx.; the dose of the *carbonate*, as a stimulant, is gr. iii.—x., and as an emetic, gr. xxx. well diluted.

Potassium.—The dose of the bichromate is gr. 1-10th—1-5th; of the permanganate is gr. i.—iii.; of the chlorate is gr. v.—xv.; of the carbonate, iodide, and nitrate is gr. v.—xx.; of the bicarbonate and bromide is gr. v.—xxx.; of the citrate and sulphate is gr. x.—xl.; of the acetate is gr. x.—3i.; of the acid tartrate is gr. xx.—3i.; and of the tartrate is gr. xxx.—3iv. As purgatives the latter two salts may be given in doses of 3ss.

Sodium.—Arsenate, gr. 1-40th—1-10th; nitrite, gr. i.—ii.; hypophosphite and dried carbonate, gr. iii.—x.; sulphocarbolate, gr. v.—xv.; iodide and sulphite, gr. v.—xx.; benzoate, bicarbonate, carbonate, and bromide, gr. v.—xxx.; salicylate, gr. x.—xxx.; phosphate and sulphate, gr. xxx.—3ii.; effervescing salts (citrate, phosphate, and sulphate), 3i.—ii.

Lithium.—Carbonate, gr. ii.—v.; citrate, gr. v.—x.; effervescing citrate, 3i.—ii.

SALTS OF THE ALKALINE EARTHS

Calcium.—The dose of the hypophosphite is gr. iii.—x.; of the chloride and phosphate, gr. x.—xv.; of the precipitated carbonate and of prepared chalk, gr. x.— $\bar{3}$ i.; of saccharated solution of lime, \mathfrak{M} xx.— $\bar{3}$ i.; and of lime water, $\bar{3}$ i.—iv.

Magnesium.—The dose of magnesia and of the carbonate is gr. v.—xxx.; that of the sulphate is gr. xxx.— $\bar{3}$ i., and of the effervescing sulphate, $\bar{3}$ i.—iv. These doses are adapted for frequent repetition; where a single dose only is administered it may safely be twice as large.

SALTS OF THE EARTHS

Aluminium.—Alum as an *astringent* is given in doses of gr. v.—x., and as a *purgative* gr. xxx.— $\bar{3}$ i.

SALTS OF THE METALS PROPER

Antimonium.—The dose of tartar emetic as a diaphoretic is gr. \mathfrak{r} -24th— \mathfrak{r} -8th; as a depressant, gr. \mathfrak{r} -8th— $\frac{1}{2}$; and as an emetic, gr. i.—ii. The remaining preparations of antimony—viz. oxide of antimony and sulphurated antimony—are given in doses of gr. i.—ii.

Argentum.—Nitrate, gr. $\frac{1}{4}$ — $\frac{1}{2}$; oxide, gr. $\frac{1}{2}$ —ii.

Bismuthum.—The dose of all the salts is gr. v.—xx.

Cerium.—Oxalate, gr. ii.—x.

Cuprum.—Sulphate, gr. $\frac{1}{4}$ —ii., or, as an *emetic*, gr. v.—x.

Ferrum.—Arsenate, gr. \mathfrak{r} -16th— $\frac{1}{4}$; dried sulphate, $\frac{1}{2}$ —iii.; sulphate, reduced iron, gr. i.—v.; tartarated iron, phosphate, iron and quinine citrate, iron and ammonium citrate, all gr. v.—x.; saccharated carbonate, gr. x.—xxx.

Hydrargyrum.—Perchloride and red iodide, gr. 1-32nd—1-16th; subchloride, gr. $\frac{1}{2}$ —v.; hydrarg. c. cretâ, gr. i.—v.

Plumbum.—Acetate, gr. i.—v.

Zincum.—Acetate, as a tonic, gr. i.—ii.; sulphate, as a tonic, and valerianate, gr. i.—iii.; oxide, gr. iii.—x.; acetate or sulphate, as an emetic, gr. x.—xxx.

ORGANIC SUBSTANCES

VEGETABLE PRODUCTS

- | | |
|---|--|
| Elatarium—Sediment from juice of fruit. | gr. 1-10th— $\frac{1}{2}$. |
| Podophylli Resina—Extracted from root. | gr. $\frac{1}{2}$ —i. |
| Cambogia—Gum-resin. | |
| Digitalis—Leaf. | |
| Ipecacuanha (expectorant)—Root. | } gr. $\frac{1}{2}$ —ii. |
| Opium—Inspissated juice of fruit. | |
| Scilla—Bulb. | gr. i.—iii. |
| Aloes—Inspissated juice of leaf. | |
| Camphora—Sublimed crystalline substance. | } gr. ii.—v. |
| Colchicum—Corm. | |
| Eucalypti Gummi—Exudation from bark. | |
| Jalapæ Resina—Extracted from tubercles. | |
| Lupulinum—Glands from strobiles. | |
| Scammonia Resina—Extracted from root. | gr. iii.—viii. |
| Rheum—Rhizome. | gr. iii.—x. |
| Scammonium—Gum-resin. | gr. v.—x. |
| Balsamum Peruvianum—Exudation from trunk. | ℥v.—xv. |
| Ammoniacum—Gum-resin. | |
| Asafetida—Gum-resin. | |
| Balsamum Tolutanum—Exudation from trunk. | } gr. v.—xv. |
| Catechu—Extract from leaves. | |
| Guaiaci Resina—Extracted from wood. | |
| Jalapa—Tubercule. | } gr. v.—xx. |
| Kino—Inspissated juice. | |
| Ipecacuanha (emetic)—Root. | gr. xv.—xx. |
| Ergota—Sclerotium. | gr. xx.— $\overline{5}$ i. |
| Copaiba—Oleo-resin. | ℥xxx.— $\overline{5}$ i. |
| Cubebs—Dried fruits. | gr. xxx.— $\overline{5}$ i. |
| Cusso—Dried flowers and tops. | $\overline{5}$ ii.— $\overline{5}$ iv. |

ALKALOIDS, ALKALOIDAL SALTS, AND OTHER ACTIVE PRINCIPLES

- Atropina. }
 Atropinæ Sulphas. } gr. $\frac{1}{100}$ — $\frac{1}{10}$.
 Hyoscinæ Hydrobromidum. }
 Hyoscyaminæ Sulphas. }
 Picrotoxinum. gr. $\frac{1}{100}$ — $\frac{1}{10}$.
 Homatropinæ Hydrobromidum. gr. $\frac{1}{80}$ — $\frac{1}{20}$.
 Physostigminæ Sulphas. gr. $\frac{1}{60}$ — $\frac{1}{20}$.
 Strychnina. }
 Strychninæ Hydrochloridum. } gr. $\frac{1}{60}$ — $\frac{1}{15}$.
 Elaterinum. gr. $\frac{1}{40}$ — $\frac{1}{10}$.
 Pilocarpinæ Nitras. gr. $\frac{1}{20}$ — $\frac{1}{2}$.
 Morphinæ Acetas. }
 Morphinæ Hydrochloridum. } gr. $\frac{1}{8}$ — $\frac{1}{2}$.
 Morphinæ Tartras. }
 Cocainæ Hydrochloridum. gr. $\frac{1}{8}$ — $\frac{1}{2}$.
 Codeina. }
 Codeinæ Phosphas. } gr. $\frac{1}{4}$ — ii.
 Aloinum. }
 Menthol. } gr. $\frac{1}{2}$ — ii.
 Thymol. }
 Caffeina. gr. i. — v.
 Quininæ Hydrochloridum. }
 Quiniæ Hydrochloridum Acidum. } gr. i. — x.
 Quininæ Sulphas. }
 Santoninum. gr. ii. — v.
 Caffeinæ Citras. gr. ii. — x.
 Salicinum. gr. v. — xx.

HYDROCARBONS, SYNTHETIC COMPOUNDS, ETC.

- Iodoformum. gr. $\frac{1}{2}$ — iii.
 Acetanilidum. gr. i. — iii.
 Naphthol. gr. iii. — x.
 Phenacetinum. gr. v. — x.
 Salol. gr. v. — xv.
 Butyl-chloral Hydras. }
 Chloral Hydras. } gr. v. — xx.
 Phenazonum. }

Sulphonal. gr. x.—xxx.
 Chloroformum. } ℥i.—v.
 Creosotum. }
 Amyl Nitris. ℥ii.—v. (*To be inhaled with caution.*)
 Terebenum. ℥v.—xv.
 Æther. ℥x.—xxx.
 Æther Aceticus. ℥xx.—xl.
 Paraldehydum. ℥xxx.—ʒii.
 Glycerinum. ʒi.—ii.

ANIMAL PRODUCTS

Thyroides Siccum. gr. iii.—x.
Moschus. } gr. v.—x.
Pepsinum. }
Fel Bovinum Purificatum. gr. v.—xv.
Oleum Morrhuæ. ʒi.—iv.

PHARMACOPŒIAL GROUPS

ACETA

The dose of both (Ipecacuanha and Squill) is ℥ x.—xxx.

AQUÆ

The ordinary dose of the aquæ is ʒss.—i., *except Aqua Laurocerasi*, the dose of which is ʒxxx.—ʒij.

CONFECTIONES

The dose of all three (Pepper, Senna, and Sulphur) is $\mathfrak{z}\text{i.}—\text{ii.}$

DECOCTA

The dose of all three (Aloes Co., Logwood, and Pomegranate Bark) is $\bar{5}$ ss.—ii.

EXTRACTA

The following are the doses of the *liquid* extracts—

- L. E. Ipecacuanhæ (*expectorant*). $\mathfrak{m}\frac{1}{2}$ —ii.
 L. E. Nucis Vomicae. $\mathfrak{m}\mathfrak{i}$.—iii.
 L. E. Cinchonæ. }
 L. E. Hamamelis. } $\mathfrak{m}\mathfrak{v}$.—xv.
 L. E. Hydrastis. }
 L. E. Jaborandi. }
 L. E. Cimicifugæ. } $\mathfrak{m}\mathfrak{v}$.—xxx.
 L. E. Opii. }
 L. E. Ergotæ. $\mathfrak{m}\mathfrak{x}$.—xxx.
 L. E. Ipecacuanhæ (*emetic*). $\mathfrak{m}\mathfrak{x}\mathfrak{v}$.—xx.
 L. E. Filicis. $\mathfrak{m}\mathfrak{x}\mathfrak{l}\mathfrak{v}$.— $\mathfrak{z}\mathfrak{i}\mathfrak{s}\mathfrak{s}$.
 L. E. Cascaræ Sagradæ. }
 L. E. Cocæ. } $\mathfrak{z}\mathfrak{i}\mathfrak{s}\mathfrak{s}$.—i.
 L. E. Glycyrrhizæ. }
 L. E. Pareiræ. } $\mathfrak{z}\mathfrak{i}\mathfrak{s}\mathfrak{s}$.—ii.
 L. E. Taraxaci. }
 L. E. Sarsæ. $\mathfrak{z}\mathfrak{i}\mathfrak{i}$.—iv.

The following are the doses of the *solid* extracts—

- E. Belladonnæ Alcoholicum. }
 E. Belladonnæ Viride. }
 E. Cannabis Indicæ. }
 E. Colchici. }
 E. Nucis Vomicae. } gr. $\frac{1}{4}$ —i.
 E. Opii. }
 E. Physostigmatis. }
 E. Stramonii. }
 E. Strophanthi. }
 E. Euonymi Siccum. gr. i.—ii.
 E. Aloes Barbadensis. gr. ii.—iv.
 E. Anthemidis. }
 E. Cascaræ Sagradæ. }
 E. Colocynthidis Co. }
 E. Ergotæ. } gr. ii.—viii.
 E. Gentianæ. }
 E. Hyoscyami Viride. }
 E. Jalapæ. }
 E. Rhei. }
 E. Krameriæ. } gr. v.—xv.
 E. Taraxaci. }

INJECTIONES HYPODERMICÆ

- | | | |
|------------------|---|----------|
| I. Cocainæ. | } | ℥ii.—v. |
| I. Morphinae. | | |
| I. Ergotæ. | | ℥iii.—x. |
| I. Apomorphinae. | | ℥v.—x. |

INFUSA

The dose of all is ʒss.—i., except—

- | | | |
|---------------|----------|---------|
| I. Digitalis. | ʒii.—iv. | |
| I. Buchu. | } | ʒi.—ii. |
| I. Cuspariæ. | | |
| I. Ergotæ. | | |
| I. Lupuli. | | |
| I. Scoparii. | | |

LIQUORES

The following are the doses—

- | | | |
|----------------------------------|----------|------------|
| L. Atropinae Sulphatis. | ℥½—i. | |
| L. Trinitrini. | ℥½—ii. | |
| L. Arsenicalis. | } | ℥ii.—viii. |
| L. Arsenici Hydrochloricus. | | |
| L. Sodii Arsenatis. | | |
| L. Strychninae Hydrochloridi. | | |
| L. Ferri Acetatis. | } | ℥v.—xv. |
| L. Ferri Perchloridi. | | |
| L. Ferri Pernitratidis. | | |
| L. Thyroidei. | | |
| L. Arsenii et Hydrargyri Iodidi. | ℥v.—xx. | |
| L. Sodæ Chlorinatae. | ℥x.—xx. | |
| L. Potassæ. | ℥x.—xxx. | |
| L. Morphinae Acetatis. | } | ℥x.—ʒi. |
| L. Morphinae Hydrochloridi. | | |
| L. Morphinae Tartratis. | | |
| L. Calcis Saccharatus. | } | ℥xx.—ʒi. |
| L. Ethyl Nitritis. | | |
| L. Bismuthi et Ammonii Citratis. | } | ℥xxx.—ʒi. |
| L. Hydrargyri Perchloridi. | | |

- L. Hydrogenii Peroxidi. ℥xxx.—ʒii.
 L. Potassii Permanganatis. ʒii.—iv.
 L. Ammonii Acetatis. } ʒii.—vi.
 L. Ammonii Citratis. }
 L. Magnesii Carbonatis. ʒi.—ii.
 L. Calcis. ʒi.—iv.

LIQUORES CONCENTRATI

The dose of all is ℥xxx.—ʒi., except—

- L. Serpentariæ Concent. ℥xxx.—ʒii.
 L. Sarsæ Co. Concent. ʒii.—ʒi.

The concentrated solutions should be prescribed in dilution with water (ʒi. in ʒi.).

MISTURÆ

The dose of all is ʒss.—i., except—

- M. Olei Ricini. }
 M. Sennæ Co. } ʒi.—ii.
 M. Spiritus Vini Gallici. }

OLEA

The dose of all is ℥½—iii., except—

- O. Crotonis. ℥½—i.
 O. Phosphoratum. ℥i.—v.
 O. Terebinthinæ (diuretic). ℥ii.—x.
 O. Copaibæ. } ℥v.—xx.
 O. Cubebæ. }
 O. Santali. ℥v.—xxx.
 O. Morrhuæ. ʒi.—iv.
 O. Ricini. ʒi.—ʒi.
 O. Terebinthinæ (anthelmintic). ʒiii.—iv.

The dose of *Oxymel* is ʒi.—ii.; and of *Oxymel Scillæ* is ℥xxx.—ʒi.

PILULÆ

The dose of all is gr. iv.—viii., except—

- P. Phosphori. gr. i.—ii.
 P. Plumbi cum Opio. } gr. ii.—iv.
 P. Saponis Composita. }
 P. Quininæ Sulphatis. gr. ii.—viii.
 P. Ferri. gr. v.—xv.

PULVERES

The following are the doses of the powders—

- P. Elaterini Co. gr. i.—iv.
 P. Opii Compositus. gr. ii.—x.
 P. Antimonialis. gr. iii.—vi.
 P. Ipecacuanhæ Compositus. gr. v.—xv.
 P. Kino Compositus. gr. v.—xx.
 P. Scammonii Compositus. gr. v.—xx.
 P. Cretæ Aromaticus cum Opio. }
 P. Cinnamomi Compositus. } gr. x.—xl.
 P. Catechu Compositus. }
 P. Cretæ Aromaticus. gr. x.—ʒi.
 P. Jalapæ Compositus. }
 P. Rhei Compositus. } gr. xx.—ʒi.
 P. Tragacanthæ Compositus. }
 P. Glycyrrhizæ Compositus. ʒi.—ii.

SPIRITUS

The dose of all is ℥v.—xx., with the following exceptions—

- S. Ætheris. }
 S. Ætheris Compositus. }
 S. Ætheris Nitrosi. } ℥xx.—xl.
 S. Ammoniac Aromaticus. } (when given repeatedly).
 S. Ammoniac Fetidus. }
 S. Juniperis. ℥xx.—ʒi.
 S. Armoraciæ Compositus. ʒi.—ii.

SUCCI

The doses of these are as follows—

- S. Belladonnæ. ℥v.—xv.
 S. Hyoscyami. ʒss.—i.
 S. Conii. ʒi.—ii.
 S. Scoparii. } ʒi.—ii.
 S. Taraxaci. }

SYRUP

The dose of all is ℥xxx.—ʒi., except—

S. Cascaræ Aromaticus.	} ℥xxx.—ʒii.
S. Chloral.	
S. Codeinæ.	
S. Ferri Iodidi.	
S. Rhei.	
S. Sennæ.	

TABELLÆ

Tabellæ Trinitrini. i.—ii.

TINCTURÆ

The tinctures, with the exception of T. Iodi, the dose of which is ℥ii.—v., fall into two groups thus—

Dose ℥v.—xv.

TT. Aconiti, Belladonnæ, Cannabis Indicæ, Cantharidis, Capsici, Chloroformi et Morphinæ Composita, Cocci, Colchici, Seminum, Croci, Digitalis, Ferri Perchloridi, Gelsemii, Lobeliæ Æthereæ, Nucis Vomicae, Opii, Podophylli, Scillæ, Stramonii, Strophanthi.

N.B.—*T. Aconiti and T. Cantharidis, frequently repeated, should be given in doses of ℥ii.—v. A single unrepeated dose of T. Opii may range from ℥xx.—℥xxx.*

Dose ℥xxx.—ʒi.

TT. Aloes, Asafetidæ, Aurantii, Benzoini Composita, Buchu, Calumbæ, Camphoræ Composita, Cardamomi Composita, Cascarillæ, Catechu, Chiratae, Cimicifugæ, Cinchonæ, Cinchonæ Composita, Cinnamomi, Conii, Cubebæ, Ergotæ Ammoniata, Gentianæ Composita, Guaiaci Ammoniata, Hamamelidis, Hydrastis, Hyoscyami, Jaborandi, Jalapæ, Kino, Krameriæ, Lavandulæ Composita, Limonis, Lupuli, Myrrhæ, Opii Ammoniata, Pruni Virginianæ, Quassia, Quillaia, Quininæ, Quininæ Ammoniata, Rhei Composita, Senegæ, Sennæ Composita, Serpentariæ, Sumbul, Tolutana, Valerianæ Ammoniata, Zingiberis.

N.B.—*For a single purgative dose, ʒii. of T. Aloes, or ʒiv. of T. Sennæ Co. or T. Rhei Co., may be given.*

TROCHISCI

From one up to six of any of the lozenges may be given, except lozenges of ipecacuanha, of which not more than three should be administered.

VINA

The following are the doses of the wines—

V. Colchici.	} m. —xxx.
V. Ipecacuanhæ (<i>expectorant</i>).	
V. Antimoniale (<i>expectorant</i>).	
V. Ferri.	} ʒi. —iv.
V. Ferri Citratis.	
V. Antimoniale (<i>emetic</i>).	ʒii. —iv.
V. Ipecacuanhæ (<i>emetic</i>).	ʒiv. —vi.
V. Quininae.	ʒiv. —ʒi.

This summary includes the chief substances contained in the Pharmacopœia of 1898. I will not now speak of *accumulation* and *toleration* of drugs, as I have elsewhere treated in detail of these important subjects.

The following quotation from an able article in the *Medico-Chirurgical Review* will form a fit conclusion to the present lesson: "Doses are the most relative things in the world. It must be confessed that a certain maturity of mind and boldness of action are requisite to escape from the slavery of posological entities and essences, and to allow the apparent exigencies of the case before us to be our sole guide. That constitutional bashfulness which is called 'caution,' which habitually delights in small ways, and which is half afraid of the instruments it uses, should practise other arts than the art of medicine. A wise courage is the physician's watchword."

LESSON VIII

VARIETIES OF MAGISTRAL FORMULÆ

In the construction of extemporaneous formulæ I can suggest to you no better models than the Official Preparations; and I have to assure you that a careful study of the *principles* which have guided the compilers of the Pharmacopœia cannot fail to render you the greatest assistance. In connection with this subject I would refer you to my *Notes on the Pharmacopœial Preparations*.

MIXTURES

Mixtures are generally extemporaneous compounds in which liquid ingredients are mixed or hold solid substances dissolved or suspended, and which are intended for internal use in divided doses.

The knowledge of incompatibility, which we have already acquired in a former lesson, will prevent us from mixing substances which chemically unite with, or decompose each other. At times, as I have already stated, we *designedly* prescribe a combination which will result in a definite chemical decomposition, but such cases are exceptional.

Certain substances which are insoluble, or nearly so, may nevertheless be prescribed in the liquid form, for internal or external use, with perfect propriety under certain conditions; thus, some insoluble salts may be *diffused by agitation*, as magnesia, calcium phosphate, quinine sulphate, etc.; other substances

may be *mixed by trituration*, as various extracts, confections, and gum-resins; others, again, may be *suspended by the aid of excipients*, as oils, copaiba, etc.

The table on pages 52 and 53, showing the solubility of certain bases and salts, can hardly fail, I think, to be appreciated by the young prescriber. It was constructed to supply a want which I myself frequently experienced in my younger days. I may mention that a much more comprehensive table than this may be found in Gray's *Supplement of the Pharmacopæia*, but the following is sufficient for the ordinary wants of the prescriber.

The term "Emulsion" is properly applied to a mixture of a milky appearance formed by the mechanical union of oily or resinous ingredients with an aqueous liquid, by means of an "excipient" which possesses the property of combining with both.

The Excipients in most common use are:—1. *Water*, which forms an emulsion with gum-resins. 2. *Mucilage of gum-acacia*, used for emulsifying oils, resins, copaiba, etc. 3. *Mucilage of gum-tragacanth*. 4. *Syrups*. 5. *Confections*. 6. *Extracts*. 7. *Yolk of egg*. 8. *Milk* for suspending scammony, as in the old official mixture of that gum-resin. 9. *Almond mixture*. 10. *Liquor Potassæ* for copaiba and fixed oils.

Not infrequently it is desirable to add a volatile oil to a mixture, and this may be done by mixing the oil in the first instance with syrup, or by rubbing it up with sugar. It may be well to remember that volatile oils should always be prescribed with some fixed oil if an emulsion is intended. Other points which I would have you bear in mind with regard to

emulsions are these: that, as a rule, *soluble salts should not be prescribed with oleaginous emulsions; spirits should not be prescribed with those which are made with yolk of egg or mucilage; and acids are incompatible with mixtures emulsified by an alkali.*

Mixtures should not be too thick; one fluid ounce should hold only ζ iss. of a vegetable powder, gr. xl. of an electuary or conserve, and gr. xx. of an extract. It is almost unnecessary for me to say that heavy insoluble powders, or those which are not mechanically diffusible, should never be prescribed in mixture.

We should always endeavour to administer our medicines in a form agreeable to the taste of the patient; for this purpose *flavouring agents* are very generally added to mixtures and draughts, etc. The following are those in most frequent use:—Tincture of cinnamon, compound tincture of cardamoms, tincture of orange, spirit of lavender, syrup of orange, syrup of lemon, syrup of ginger, aromatic syrup, syrup of Virginian prune. Some flavouring agents which are very extensively prescribed require the addition of viscid excipients; such are oil of carraway, oil of cinnamon, oil of cloves, tincture of balsam of tolu, spirit of nutmeg, and others.

The diluents most frequently employed in liquid preparations for internal use are:—Distilled water, medicated waters, infusions, and decoctions, etc. Nothing looks so bad, and is so likely to create misgivings in the mind of a patient, as to receive a bottle of medicine incompletely filled. It will be well, therefore, for the prescriber always to order such a quantity of a liquid remedy, whether for internal or external

TABLE OF SOLUBILITY.

IN WATER.		IN ALCOHOL.	
Soluble.	Insoluble.	Soluble.	Insoluble.
Acid. Arseniosum—1 in 100 <i>cold</i> Acid. Benzoicum—1 in 400 <i>cold</i> Acid. Boreum—1 in 30 <i>cold</i> Alumen—1 in 10 <i>cold</i> , 10 in 4 <i>boiling</i> Ammon. Benzoes—1 in 6 " Bromid.—1 in 14 " Carb.—1 in 4 " Chlorid.—1 in 3 " Phosph.—1 in 4 Antim. Tart.—1 in 17 <i>cold</i> " " 1 in 3 <i>boiling</i> Argent. Nit.—2 in 1 at 60° F. Atropina—1 in 300 " Sulphas—1 in 1 Borax—1 in 25 Caffeina—1 in 80 Citras—1 in 32 Calcii Chlorid.—1 in 1 Calcii Hypophosph.—1 in 8 Calx—A pint of water at 68° F. dis- solves nearly 11 grains Calx Chlorinatus—partially soluble Codeina—1 in 80 " Phosph.—1 in 4 Cupri Sulph.—1 in 4 Ferri et Ammon. Cit.—2 in 1 " Quininae Cit.—2 in 1 " Sulph.—1 in 14 Ferrum Tart.—1 in 4 Hydrag. Perchlor.—1 in 16 <i>cold</i>	Antim. Oxid. " Sulphurat. Argent. Oxid. Bismuth. Carb. " Oxid. " Subnit. Calcii Phosph. Cerii Oxalas Cocaina Creta Praep. Ferri Arsenas " Carb. Sacch. " Phosph. Hydrag. Ammon. " Iodid. Rub. " Oxid. Flav. " Rub. " Subchlor. Iodoformum Magnesia—almost, but more soluble in cold than in hot water Magnesii Carb. Phenacetinum—almost	Ammonii Benz. " Carb.—sparingly " Nit.—sparingly in 90 % " Bromid. " Chlorid. Antim. Tart.—sparingly soluble in 45 % Argent. Nit.—soluble in 90 % Calcii Chlorid. Ferrum Tart.—sparingly Hyd. Iodid. Rub.—sparingly. Is soluble in ether and in aqueous solution of iodide of potassium Hyd. Perchlor.—1 in 3 of 90 % Phenacetinum—1 in 20 Potassa Caust. Potassii Acet. " Bromid. " Iodid. Sodii Hypophosph. " Chlorid.—not soluble in abso- lute alcohol Zinci Chlorid.—also in ether " Valerianas	Alumen. Ammon. Phosph.—in- soluble in 90 % Antim. Tart.—insoluble in absolute alcohol Argent. Nit.—insoluble in absolute alcohol, slightly soluble in 90 % Borax Calcii Hypophosph.— insoluble in 90 % Ferri et Ammon. Cit. " Quininae Cit. " Sulph. Hydrag. Ammon.—in- soluble also in ether Hydrag. Subchlor.— insoluble also in ether Lithii Carb. Potassii Bicarb. " Carb. " Cit.

PRESCRIPTIONS		PRESCRIPTIONS	
<p> Lithiū Carb.—i in 70 Cit.—i in 2 Magnes. Sulph.—i in 1 Morphinæ Acetas—i in 3 Hydrochl.—i in 24 Tartas—i in 11 Paraldehydum—i in 10 Phenazonum—i in 1 Picrotoxinum—i in 330 Potassa Caust.—2 in 1 Potassii Acet.—2 in 1 Bicarb.—i in 4 Brom.—i in 2 Carb.—i in 1 Chloras—i in 16 cold Cit.—10 in 6 Iodid.—4 in 3 Nit.—i in 4 cold Permang.—i in 20 Sulph.—i in 10 cold Tart.—i in 1 Tart. Acid.—i in 200 cold i in 18 boiling Plumbi Acet.—10 in 25 Iodid.—i in 200 boiling Quinin. Hydrochl.—i in 40 Salicin—i in 28 cold Sodii Bicarb.—i in 11 Bromid.—i in 2 Carb.—i in 2 Hypophosph.—i in 1 Nitris—freely Phosph.—i in 6 Salicylas—freely Sulph.—i in 3 cold Zinci Acet.—10 in 25 Chlorid.—10 in 4 Sulph.—10 in 7 Valerian.—i in 120 cold </p>	<p> Plumbi Carb. Salol Zinci Carb. " Oxid. </p>	<p> Argem. Nit.—soluble in 10 Calci Chlorid. Perum Tart. Hydr. Iodid.—Rob. <i>sp. in 100</i> Hydr. Perchlor.—i in 3 of 90 Phos. citium—i in 20 Potassa Caust. Potassii Acet. Sulph. Hydr. Sulph. Chlorid.—soluble in 10 Valerian.—soluble in 10 </p>	<p> Potassii Sulph. " Tart. " Tart. Acid. Soda Tartarata Sodii Carb. " Sulph. " Chlorid. Zinci Sulph. </p>

use, as will accurately fill one of the bottles of generally-recognised capacity. For instance, we might order two, three, four, six, or eight ounces of a mixture, not five or seven ounces.

DRAUGHTS

A "draught" is an extemporaneous liquid preparation which differs from a mixture in containing a single dose. It is usually dispensed in a phial holding one or two ounces.

Draughts possess the advantages of convenience, and are preferable to mixtures for the administration of medicines which would be liable to suffer by repeated removal of the cork.

POWDERS

Powders are either simple or compound.

Insoluble substances, substances which would be chemically incompatible in the liquid form, and certain pulverisable extracts, are suited to this mode of administration. Some substances should never be prescribed in the form of powder, such are—those which have an extremely nauseous taste and odour; deliquescent, efflorescent, and very volatile substances; substances requiring administration in large doses, and substances which liquefy on mixing. The prescriber should carefully bear in mind that active substances, the dose of which is very small, should always be "diluted," so to speak, with some inert powder, such as starch, gum, liquorice-root, milk sugar, etc. The addition of an inert powder is often

... of the compound ...
... of tamar is added to the ...
... substance ... be ...
... of oil, we can ...
... of colocynd ... best ...
... with a drop of ...
It is very necessary for the ...
... certain dry saline substan ...
... with each other. ...
... sulphate is rubbed up w ...
... and when lead acetat ...
... sulphate.
The following salts are DELI ...
Calcii Chloridum.
Lithii Citras.
Lithii Carbonas.
Potassii Acet.
... Carbonas.
Ammonium Phosphate and
Phosphate and Sulphate are
Alum. Borax, Copper Sulphate
Tamar. Emetic are also slightly
such a degree as to ...
in the form of powder.
Powders are generally pre ...
each containing a de ...

useful for its dividing or comminuting properties ; it is partly with this object that potassium sulphate is added to the compound powder of ipecacuanha, and cream of tartar is added to the compound powder of jalap.

Some substances cannot be pulverised without the addition of other bodies ; thus myrrh, gamboge, etc., require sugar or hard gum : some gum-resins, as asafetida and scammony, require the addition of a drop of almond oil, while camphor and hard compound extract of colocynth are best pulverised if slightly moistened with a drop of alcohol.

It is very necessary for the prescriber to be aware that certain dry saline substances become moist on trituration with each other. This is the case when sodium sulphate is rubbed up with potassium carbonate, and when lead acetate is mixed with zinc sulphate.

The following salts are DELIQUESCENT :—

Calcii Chloridum.	Potassii Citras.
Lithii Citras.	Potassa Sulphurata.
Potassa Caustica.	Potassii Tartras.
Potassii Acetas.	Zinci Chloridum.
„ Carbonas.	

Ammonium Phosphate and Sodium Carbonate, Phosphate, and Sulphate are EFFLORESCENT salts. Alum, Borax, Copper Sulphate, Zinc Sulphate, and Tartar Emetic are also slightly efflorescent, but not in such a degree as to preclude their administration in the form of powder.

Powders are generally prescribed in papers (*chartulæ*), each containing a dose.

ingredients: solids require a soft or liquid excipient, and soft or liquid substances require an inert powder.

The following are the excipients most frequently employed:—

1. *Oil*. Volatile oils, unless rich in resinous ingredients, will not hold the mass well together.

2. *Mucilage*, adapted for powders. Pills made with mucilage are suited only for immediate use, as they become hard and difficult of solution in the stomach. Mucilage should not be prescribed with salts of lead.

3. *Crumb of bread* should not be prescribed with silver nitrate until the sodium chloride which it contains has first been removed.

4. *Vegetable extracts*, available as excipients for powders.

5. *Confection of roses*. Adapted for heavy powders. The confection of roses contains tannin, and hence should not be prescribed with substances with which tannin is incompatible. This confection is also incompatible with sulphurated antimony.

6. *Soap*. Well adapted for fatty substances, and for resinous bodies, the solubility of which it increases. Camphor may be very well combined with soap and clarified honey. Soap should not be used for substances which are decomposed by alkalies; it is consequently incompatible with tartar emetic.

7. *Clarified honey, syrup, glucose*. Suitable as excipients for powders. They should not be prescribed with substances which are liable to be reduced by the presence of sugar, as calomel.

Clarified honey combined with tragacanth forms a useful adhesive excipient; and twenty grains of gum-

tragacanth, with an ounce of *glycerin*, also forms an excellent mass.

8. *Alcohol* is sometimes employed to give the requisite consistence to gums, gum-resins, camphor, compound extract of colocynth, etc.

9. *Inert powders*, as liquorice and starch, are used to give adhesiveness to soft extracts, etc. Some substances, as certain vegetable extracts, do not require the addition of any excipient. I may mention that manna is occasionally used, and that it is particularly adapted as an excipient for reduced iron.

Some substances liquefy when mixed. Thus it would be impossible to form a pill-mass with camphor and copaiba, unless we add some such substance as yolk of egg.

Copaiba may be readily made into a pill-mass by rubbing it up with freshly-calced magnesia, in the proportion of sixteen parts by weight of the former to one of the latter.

The prescriber should carefully bear in mind that a pill composed chiefly of vegetable matter *should not exceed five grains* in weight, but a pill, the principal bulk of which is made up of metallic substances, may weigh six, or even eight grains.

Pills are sometimes covered with gold or silver leaf, gelatin, collodion, sugar, albumen, etc., to prevent taste, and to give them a nice appearance. Pills containing mercury, free iodine, or sulphur, should not be covered with gold or silver leaf.

Pills should never be administered to young children.

A *bolus* is similar to but larger than a pill; it is a form of medicine not much used at the present day.

CONFECTIONS, CONSERVES, AND ELECTUARIES

These preparations are of the consistency of paste, and are made by mixing up substances with sugar, syrup, or honey. Properly speaking, the object of the sugar in confections and conserves is to act as a preservative, while in electuaries it is merely employed to confer consistency. Mucilage is objectionable as an excipient, as an electuary made with it soon becomes hard.

These preparations should be sufficiently solid to prevent a separation of the ingredients, and yet so soft that they can be easily swallowed without mastication, thus: *dry vegetable powders* require the addition of twice their weight of syrup or honey; *gummy or resinous powders* require an equal weight; while *metallic powders* are best made up with a conserve.

Nauseous or deliquescent substances, or those which do not unite intimately with syrup, such as oils, balsams, etc., should not be prescribed in this form.

LOZENGES, OR TROCHES

Small medicated cakes, intended to dissolve slowly in the mouth. They are made into a mass with sugar and some glutinous material, and dried with the aid of a moderate heat. The official lozengès are made with one or other of the pastes described as Fruit basis, Rose basis, Simple basis, and Tolu basis. This form of administration is adapted for medicines which have not a disagreeable taste, or the taste of which can be covered or modified.

As a rule, they should weigh from eight to ten grains. A study of the directions for preparing the official Trochisci will be of service to the prescriber.

The Tablets of Nitroglycerin are made of chocolate, and weigh five grains; each contains one-hundredth of a grain of nitroglycerin.

INHALATIONS—VAPOURS

These are medicines in the form of gases or vapours intended to be inhaled so as to act on the air-passages and respiratory organs. Examples of the mode of prescribing them will be given in future lessons.

GARGLES

Liquid medicines for application to the back part of the mouth or upper part of the throat. The only special direction which I consider necessary at present to inculcate with regard to them is, that as they are sometimes liable to be swallowed owing to accident or negligence, they should not contain substances which would cause unpleasant or untoward symptoms.

INJECTIONS

Liquid medicines intended to be thrown into a cavity of the body by means of a syringe. Hypodermic injections are introduced beneath the skin or into the substance of a muscle.

ENEMAS, OR CLYSTERS

Liquid medicines intended to be thrown into the rectum. They are usually made of a mucilagin-

ous excipient, to which medicinal agents are added. Water is the best vehicle for astringent vegetable matter, metallic salts, or mineral acids. Oleaginous or resinous substances should be emulsified.

An enema should be warm, and its bulk should be proportioned to the effect which we desire to produce. The bulk should be large if we aim at purgation, but if our object is to produce a local effect, or to act on the system, the bulk should be small. The proper quantity for an infant one month old is one fluid ounce; that for a child a year old is two and a half ounces; for a child from one to seven years of age, three or four ounces; for a child from seven to twelve years old, six to seven ounces; and for a patient aged from twelve years upwards the quantity should be half a pint or more. The dose of active ingredients should be three or four times greater than if administered by the mouth, as the rectum is less susceptible; but this remark does not apply to the administration of narcotics such as opium.

An enema is of great use when we desire to evacuate the bowel speedily, in cases where we cannot administer a purgative by the mouth. An enema of glycerin (5i.) often acts well. Enemas are also indicated in cases requiring direct medication of the lower bowel, as in dysentery, etc., or in disease of the bowel, and for the dislodgment of thread-worms. Anodyne enemas are of great service in the treatment of irritation of the rectum, or of the neighbouring organs, as the bladder or uterus. Nutritive enemas are given to sustain life when the patient is unable to swallow, or when it is desired to give

rest to the stomach. They may with advantage be peptonised by the aid of pancreatic solution.

SUPPOSITORIES

Medicines intended to be placed in the rectum in order to produce a local action, or to act on the system. They are usually cone-shaped masses, having the active agent incorporated with some substance capable of retaining the proper shape, as soap, spermaceti, gelatin, cocoa-butter. The latter is sometimes too soft of itself, but this defect is remedied by the addition of about an eighth part of wax.

EYE-WASHES

Collyria or eye-washes are generally composed of solutions of astringent salts, as zinc sulphate or acetate, copper sulphate, iron sulphate, silver nitrate. The strength of the solution seldom exceeds eight grains to the ounce.

CATAPLASMS, OR POULTICES

External applications generally employed to promote suppuration, to allay pain and inflammation, and to resolve swellings, etc. They should be hot, soft, moist, not too heavy or too bulky, and should be sufficiently tenacious to accommodate themselves to the parts to which they are applied. The addition of a little lard, olive oil, or glycerin, is very useful to prevent hardening, and to promote the emollient action.

External applications
which be soft and
of the body.
They are chiefly com-
bined with astringent
resin. They are their
1. Chemical action
fatty acid.
2. Admixture of fat or w
3. Chemical action of
as in Emp. Ammonia

UNIM

Semi-liquid ointments, or
administered by friction.
An "Embrocation" is a
consistence.

1011

External applications of
solutions of simple solutions
and usually applied by wetting

ONTV

Soft unctuous substan-
munction. They should h
over. When the a
fresh and free from salt
rest each part. L and

PLASTERS

External applications, spread on leather, linen, or silk, which become soft and adherent at the temperature of the body.

They are chiefly composed of fatty substances, combined with metallic oxides, powders, wax, or resin. They owe their consistency either to—

1. Chemical combination of lead oxide with a fatty acid.
2. Admixture of fat or wax and resin.
3. Chemical action of the ingredients on each other, as in *Emp. Ammoniaci cum Hydrargyro*.

LINIMENTS

Semi-liquid ointments, or soapy applications, generally administered by friction with the hand.

An "Embrocation" is a preparation of a thinner consistence.

LOTIONS

External applications or washes, generally consisting of simple solutions of medicinal substances, and usually applied by wetting a piece of lint or linen.

OINTMENTS

Soft unctuous substances applied to the skin by inunction. They should have the consistency of good butter. Where the active ingredients are pulverulent, fresh lard free from salt, or paraffin ointment, is the best excipient. Liquid or semi-liquid ingredients

require prepared suet, or a mixture of suet and lard, or sometimes wax. On the other hand, if the ingredients form too dense a mass, oil may be added. A good vehicle for active ingredients is benzoated lard.

"Cerates," so called from containing wax, are of a firmer consistence than ointments.

FUMIGATIONS

Vapours or gases extemporaneously set free for deodorising or disinfecting purposes, or to produce medicinal action on certain parts of the body with which they are brought into contact.

In the following lessons we will endeavour to apply the principles, the study of which has hitherto occupied our attention.

CONCLUDING LESSONS

EXAMPLES AND EXERCISES

I purpose devoting our concluding lessons to examples and exercises: and I trust that the arrangement I have adopted will be found to conduce to convenience, and to invest the subject with additional interest.

ANTACIDS

Antacids are medicines which counteract acidity, acting chemically by neutralising the acid.

"Direct" antacids are those which directly neutralise

the body of the patient
Antacids are medicines which
the food, and the
secretions. Antacids are
classes—1st. Those which
d. Those which are
ammonia and ammonium
are remote but not direct,
sodium combined with so-
tartrate. In the latter
becomes converted into co-
The physician will remem-
in their action
should not be co-
course of alkalies is indicat-
with some vegetable tom-
continued at intervals.
The following is a list
pharmacopoeial preparation

Ammon. Liq. ʒi.
Ammon. Carb. gr. ʒi.
Spt. Ammon.

Calcis Liq. ʒi.
Calcis Liq. ʒi.
Calcis Carb. ʒi.
Crete Prep. gr. ʒi.
Met. Crete.
Pulv. Crete.
Pulv. Crete.
Hydrarg. c. C.

Lith. Carb. gr. ʒi.
Lith. Cit. gr. ʒi.
Lith. Cit. ʒi.

the acidity of the stomach and intestines ; " Remote " antacids are those which increase the normal alkalinity of the blood, and, through it, correct acidity of the secretions. Antacids may be divided into three classes :—1st. Those which are both direct and remote. 2nd. Those which are direct but not remote, as ammonia and ammonium salts. 3rd. Those which are remote but not direct, for instance potassium or sodium combined with some vegetable acid, as citric or tartaric. In the latter case the vegetable acid becomes converted into carbonic acid in the system. The physician will remember that antacids are only *palliative* in their action. The administration of alkalies should not be continued too long ; when a course of alkalies is indicated, they should be combined with some vegetable tonic, and they should be discontinued at intervals.

The following is a list of the antacids with their pharmacopœial preparations and doses :—

Ammon. Liquor. ℥x.—xxx.

Ammon. Carb. gr. iii.—x.

Spt. Ammon. Arom. ℥xx.—xl.

Calcis Liquor. ℥i.—iv.

Calcis Liquor Sacch. ℥xx.—℥i.

Calcii Carb. Præcip. gr. x.—℥i.

Creta Præp. gr. x.—℥i.

Mist. Cretæ. ℥ss.—i.

Pulv. Cretæ Ar. gr. x.—℥i.

Pulv. Cretæ Ar. c. Opio. gr. x.—xl.

Hydrarg. c. Creta. gr. i.—v.

Lithii Carb. gr. ii.—v.

Lithii Cit. gr. v.—x.

Lith. Cit. Effervescens. ℥i.—ii.

Magnesia Ponderosa.
 Magnesia Levis. } gr. v.—xxx.
 Magnesii Carb. Ponderosa.
 Magnesii Carb. Levis.
Liq. Magnes. Carb. ℥i.—ii.

Potassæ Liquor. ℥x.—xxx., freely diluted.
 Potassii Bicarb. gr. v.—xxx.
 Potassii Carb. gr. v.—xx.

Sodii Bicarb. gr. v.—xxx.
Trochisci Sodii Bicarb. (gr. iii. in each). 1—6.
 Sodii Carb. gr. v.—xxx.
Sodii Carb. Exsicc. gr. iii.—x.

REMOTE ANTACIDS

Salts of potassium or sodium combined with a vegetable acid, as citric or tartaric.

1. Prescribe a mixture for a case of acidity with flatulent distension of the stomach.

R
 Liquoris Ammoniacæ, drachmam.
 Misturæ Amygdalæ, uncias octo.
 Misce. Fiat mistura. Capiat cochlearia duo magna bis terve in die.

In this case we select *ammonia* as it is a volatile antacid; ammonium carbonate would be inadmissible, as the evolution of carbonic acid gas in the stomach would increase the flatulence. The student will notice that we have prescribed the ammonia in a large quantity of *bland* fluid, a precaution which it is always well to observe in administering liquor ammoniacæ.

2. Prescribe Ammonium Carbonate in effervescence.

R

Ammonii Carbonatis, grana sex.
Syrupi Aurantii, drachmas duas.
Aquæ, drachmas decem.

Misce. Fiat haustus, cui, tempore capiendi, adde Succo Limonis recentis cochleare medium unum, et in effervescentiâ sumatur.

Not infrequently at examinations and in practice you will be required to prescribe certain substances in a state of effervescence. The following table, showing the proportions which should be ordered to produce approximate neutralisation, will be found of use—

		Lemon Juice.	Citric Acid.	Tartaric Acid.
20 grains of	Ammon. Carb.	℥vi.	gr. 23½	gr. 25½
	Pot. Bicarb.	℥iii.	gr. 14	gr. 15
	Sodii Bicarb.	℥iv.	gr. 16	gr. 17½

3. Prescribe a mixture containing Ammonium Carbonate with a salt of iron and a vegetable infusion.

R

Ammonii Carbonatis, semidrachmam.
Ferri Tartarati, grana quadraginta.
Syrupi Zingiberis, unciam.

Infusi Quassiae, ad uncias octo.

Misce. Fiat mistura. Capiat cochlearia duo magna bis in die.

This prescription serves to illustrate several important facts. It shows that ammonium carbonate, although incompatible with other salts of iron, may be given

with ferrum tartaratum. Syrup of ginger is preferred to syrup of orange, which is turned black by the iron. Infusion of quassia, which does not contain tannin, is an excellent vehicle for iron salts.

4. Prescribe an Alkali in combination with Magnesium Sulphate.

R

Sodii Bicarbonatis, drachmas duas.

Magnesii Sulphatis, uncias duas.

Syrupi Aurantii, unciam.

Infusi Cascarillæ, ad uncias octo.

Misce. Fiat mistura, cujus capiat cochlearia duo ampla sextis horis.

Carbonates of the alkalies are incompatible with magnesium sulphate, but the *bi-carbonates* may be prescribed with that salt. Ammonium carbonate is not incompatible with magnesium sulphate.

5. Prescribe a stimulating Antacid Draught.

R

Ammonii Carbonatis, grana quinque.

Spiritûs Ammoniaci Aromatici, semidrachmam.

Spiritûs Chloroformi, semidrachmam.

Aquæ Camphoræ, unciam cum semisse.

Misce. Fiat haustus, statim sumendus.

6. Prescribe for a case of acidity with diarrhœa.

R

Tincturæ Opii, semidrachmam.

Spiritûs Chloroformi, drachmam.

Misturæ Cretæ, uncias tres.

Aquæ Menthæ Piperitæ, uncias tres.

Misce. Fiat mistura, cujus sumantur cochlearia duo magna post unamquamque sedem mollem, phialâ prius concussâ.

Preparations of lime should always be selected in cases of acidity with diarrhœa.

The following is an agreeable method of administering Lime-water—

℞
Liquoris Calcis, uncias duas.
Aquæ Laurocerasi, minima quindecim.
Lactis recentis, uncias duas.
Misce. Fiat haustus, mane sumendus.

7. Prescribe alkaline powders for a case of Uric Acid Diathesis.

℞
Lithii Carbonatis, grana triginta.
Pulveris Colchici Cormi, grana duodecim.
Misce, et in pulveres sex divide. Sumat unam sextis horis.

When sodium urate is deposited in the tissues, the lithium salts are preferable to those of potassium or sodium, as lithium urate is formed, which is very soluble and easily eliminated from the system. Colchicum will generally be found a judicious combination with lithium salts in acute gout.

8. Prescribe a mixture containing a salt of Lithium.

℞
Lithii Citratis, drachmam.
Syrupi Limonis, unciam.
Tincturæ Colchici Seminum, drachmam cum semisse.
Aquæ ad uncias octo.
Misce. Fiat mistura. Capiat cochlearia duo magna bis in die.

The lithium citrate is more soluble than the carbonate, and hence is better suited for the liquid form of administration. Syrup of lemon is preferred to that of orange, as being a more suitable combination with a citrate.

9. Prescribe a mixture for a case of acidity with constipation.

R

Magnesiae Ponderosæ, semiunciam.
 Mucilaginis Tragacanthæ, uncias quatuor.
 Syrupi Zingiberis, unciam.
 Aquæ Menthæ Piperitæ, uncias tres.
 Misce. Fiat mistura. Capiat cochlearia duo magna ter in die, phialâ prius concussâ.

The student might have suggested the addition of magnesium sulphate to the above, but very often the magnesia becomes aggregated into a solid mass when prescribed with the sulphate. The above prescription illustrates the necessity of suspending an insoluble substance by means of a mucilaginous excipient.

10. Prescribe a mixture for a case in which we desire to correct acidity of the urine.

R

Liquoris Potassæ, drachmas duas.
 Tincturæ Calumbæ, drachmas duas.
 Infusi Calumbæ, ad uncias sex.
 Misce. Fiat mistura. Capiat cochlearia duo magna ter in die.

We select potash in such a case, as its action is chiefly directed towards the urinary organs.

Liquor potassæ may well be given in beer or broth, which will effectually conceal its nauseous taste.

11. Prescribe for a case of acidity with deficient secretion of bile.

R

Sodii Bicarbonatis, drachmam cum semisse.
 Decocti Taraxaci Radicis (5j. ad Oj.), uncias sex.
 Misce. Fiat mistura. Capiat cochlearia duo magna bis in die.

In this case the sodium salts are the appropriate remedies, as they exert a special action on the liver.

12. It will at once be seen that the carbonate is the only one which is not a stimulant in the stomach.

ANTHELMINTICS

Medicines which destroy the worms are termed Vermifuges. Anthelmintics may be divided into two classes:—

1. Those which destroy the worms.
2. Those which expel the worms.

as ordinary purgatives, and expel the worms.

Different worms infest the human system, thus the Anthelmintics must be selected according to the situation of the worms. Thus the Anthelmintics which act on the small intestine are the best for the treatment of the worms of the small intestine. The Anthelmintics which act on the large intestine are the best for the treatment of the worms of the large intestine. The Anthelmintics which act on the liver are the best for the treatment of the worms of the liver.

The Anthelmintics which act on the small intestine are the best for the treatment of the worms of the small intestine. The Anthelmintics which act on the large intestine are the best for the treatment of the worms of the large intestine. The Anthelmintics which act on the liver are the best for the treatment of the worms of the liver.

12. Prescribe pills containing Sodium Carbonate.

℞
Sodii Carbonatis Exsiccati, drachmam.
Pulveris Ipecacuanhæ, grana decem.
Saponis Duri, grana viginti.
Syrupi, quantum sufficiat ut fiat massa, in pilulas viginti
dividenda, e quibus capiat tres in dies.

It will at once be seen that the *dried* sodium carbonate is the only preparation adapted for administration in pill.

ANTHELMINTICS

Medicines which destroy or expel worms; the former are termed *Vermicides*, the latter *Vermifuges*.

Anthelmintics may be divided into three classes:—

1. Those which destroy but do not expel the worm.
2. Those which expel but do not destroy the worm, as ordinary purgatives.
3. Those which both destroy and expel the worm.

Different worms inhabit different portions of the intestines; thus the *Ascaris lumbricoides* generally occupies the small intestines, the *Tricocephalus dispar* inhabits the cæcum and large intestine, while the *Oxyuris vermicularis* resides in the rectum, and is hence best treated by enemata. The *Tenia solium* occupies the small intestines extending upwards and downwards.

The action of anthelmintics is only temporary, and consequently we must correct the state of constitution which predisposes to the multiplication of worms; this is best effected by strict attention to hygienic rules, and the administration of bitter tonics, as quassia and nux vomica, and preparations of iron. As a rule, the

administration of anthelmintics should be continued for some time after the expulsion of the worms. Most of the anthelmintics act especially on the tape worm, but santonin acts more effectually on the round worms, while oil of turpentine is equally efficacious against both round and flat worms. As a rule, the administration of anthelmintics should be accompanied or followed by a cathartic.

Anthelmintics should be given on an empty stomach, or should be preceded by a cathartic, in order to expose the worm to the full action of the medicine.

The following anthelmintics are official—

Cusso. ℥ss.—i.
 Filix Mas.
Extract, Liquid. ℥xliv.—xc.
 Granati Cort.
Decoctum. ℥ss.—ii.
 Santoninum. gr. ii.—v.
 Terebinthinæ Oleum. ℥iii.—iv.

1. Prescribe Cusso in form of an electuary.

R

Cusso, in pulvere, drachmas tres.
 Mellis Depurati, quantum sufficiat ut fiat Electuarium.
 Cras primo mane sumendum. Postea adhibeatur mistura
 purgans ad plenam alvi solutionem.

I may here mention that if it be required to administer an infusion of cusso, it may be made with 1 part of the drug to 16 of water, and must not be strained; fresh lemon-juice may be advantageously added.

2. Order a draught containing Extract of Male-fern.

R
Extracti Filicis Liquidi, drachmam.
Misturæ Amygdalæ, unciam cum semis.
Misce. Fiat haustus, primo mane sumendus. Postea adhibeatur mistura purgans ad plenam alvi solutionem.

The liquid extract of male-fern should be given, as above, suspended in some emulsified liquid.

3. Prescribe Pomegranate Bark.

R
Tincturæ Jalapæ, unciam.
Tincturæ Nucis Vomicae, drachmam cum semis.
Syrupi Zingiberis, unciam.
Decocti Granati Corticis, uncias sex.
Misce. Fiat mistura. Capiat cochlearia duo magna omni mane.

This will be found an excellent combination in cases where we desire to correct the state of constitution which predisposes to the multiplication of worms. The powdered root-bark of pomegranate may also be well given in the form of powder combined with some aromatic vegetable powder, as the compound powder of cinnamon.

4. Write a prescription ordering pills of Santonin and Aloes.

R
Santonini, grana duodecim.
Pilulæ Aloes et Ferri, grana octodecim.
Misce. Fiant pilulæ sex, quarum capiat unam omni mane. Deaurentur pilulæ.

This will be found a very useful formula for the treatment of the short thread-worm. The administration in the form of silvered pills, and the special action of aloes on the lower portion of the bowel, have been considered in devising this combination.

Santonin may also be very well given with an emulsion of castor oil, as recommended by Küchenmeister.

5. Order an enema for an adult containing Oil of Turpentine and Santonin.

R
Olei Terebinthinæ, unciam.
Santonini, grana quinque.
Mucilaginis Amyli (℥iii. ad ℥xv. Aq.), uncias quindecim.
Misce. Fiat enema. Injiciatur horâ somni tertiâ quâque nocte.

The above will be found extremely useful in the treatment of the short thread-worm.

ANTISPASMODICS

Medicines which allay spasm.

Antispasmodics may be divided into *Direct* and *Indirect*. The former act by exerting a tonic influence on the spinal cord, the latter by removing the exciting cause of the spasmodic action.

Antispasmodics vary in their effects on individuals; they act rapidly, but soon lose their power. During a course of antispasmodic treatment it will be well to vary the remedy at times.

We have here to treat only of the Direct Antispasmodics, of which the following are in use—

Asafetida. gr. v.—xv.
Pil. Aloes et Asafetida. gr. iv.—viii.
Pil. Galbani Comp. gr. iv.—viii.
Spiritus Ammoniac Fetid. ℥xx.—xl.
Tinctura Asafetida. ℥xxx.—℥i.
Galbanum. gr. v.—xv.
Pil. Galbani Comp. gr. iv.—viii.
Moschus. gr. v.—x.

Sambul Radix. gr. xx.— ʒi .
Tinctura. ℥xxx .— ʒi .
 Valerianæ Rhizoma. gr. x.—xxx.
Tinctura Valerianæ Ammoniata. ℥xxx .— ʒi .
 Zinci Valerianas. gr. i.—iii.

In the prescriptions in the two preceding sections we have written the quantities in words; this will not be necessary in future, and we shall accordingly employ the symbols in general use.

1. Prescribe Asafetida in a liquid form.

℞ Spiritus Ammoniacæ Fetidi, ʒiv .
 Spiritus Ammoniacæ Aromatici, ʒiv .
 Spiritus Chloroformi, ʒii .
 Aquæ Camphoræ, ad ʒviii .
 Misce. Fiat mistura. Sumat cochlearia duo magna tertiâ quâque horâ.

The fetid spirit of ammonia should always be selected if it be desired to administer a liquid preparation of asafetida by the mouth. If it be desired to prescribe the tincture of asafetida, the prescriber will remember that, like all other tinctures of gum-resins, it must be suspended with mucilage.

2. Order a dozen pills to consist of Musk and Camphor.

℞ Moschi, gr. xviii.
 Camphoræ, gr. xii.
 Spiritus rectificati, ℥iii .
 Syrupi Glucosi, quantum sufficiat ut fiat massa, in pilulas duodecim dividenda e quibus capiat duas ter in die.

The object of the rectified spirit is to pulverise the camphor. As a rule it will not be necessary for the prescriber to order it in his formula.

3. Write for a draught to contain Musk.

℞

Moschi, gr. x.

Ammonii Carbonatis, gr. ii.

Spiritus Ætheris, ℥xxx.

Mucilaginis Acaciæ, ℥iv.

Aquæ Camphoræ, ℥i.

Misce. Fiat haustas, horâ somni vel vespertinâ sumendus.

In this prescription ammonium carbonate is introduced, as it increases the efficacy of musk; spirit of ether is employed, as ether is a good solvent of musk. Probably camphor-water is the best vehicle which could be selected.

4. Prescribe a mixture containing Sumbul.

℞

Tincturæ Sumbul, ℥ii.

Spiritus Chloroformi, ℥ii.

Aquæ Menthæ Piperitæ, ad ℥vi.

Misce. Fiat mistura, sumat cochlearia duo magna tertiis vel quartis horis.

5. Prescribe a mixture containing Valerian.

℞

Tincturæ Valerianæ Ammoniatæ, ℥iii.

Spiritus Chloroformi, ℥ii.

Aquæ Camphoræ, ad ℥viii.

Misce. Fiat mistura, cujus sumat cochlearia duo magna sextis horis.

The ammoniated tincture is certainly the most eligible preparation of valerian for administration, in the liquid form by the mouth.

6. Prescribe Zinc Valerianate.

℞

Zinci Valerianatis, gr. xxiv.

Confectionis Rosæ Gallicæ, quantum sufficiat ut fiat massa, in pilulas duodecim dividenda. Sumat unam bis in die. Deaurentur pilulæ.

ASTRINGENT

Medicines, the primary effect of which is to diminish secretion and excretion, and which have astringent influence.

Astringents may be said to act in two ways:

1. By diminishing the alkaline secretion, and thus to increase its coagulative tendency.

2. By causing condensation of the fluids, by inducing contraction of the vessels, and thus to diminish the calibre of capillaries.

Of glands. Whenever astringents is required, their action should be stopped at intervals.

The following are the chief astringents, arranged in alphabetical order—

Acid. Acet. Dil. ℥xxx.

Dry. 1. 5℥—ii.

Acid. Cit. 1. gr. i.—ii.

Acid. Gallic. 1. ℥i.

Acid. Nitric. 1. ℥i.

Acid. Sulphuric. 1. ℥i.

Acid. Tartaric. 1. ℥i.

Acid. Valerianic. 1. ℥i.

Acid. Vinic. 1. ℥i.

Acid. 1. ℥i.

Acid. 1. ℥i.

Acid. 1. ℥i.

On account of its disagreeable taste, it is best to administer the valerianate in the form of pill.

Zinc valerianate is incompatible with all acids, most metallic salts, soluble carbonates, and vegetable astringents. Quinine valerianate, although not official, is often prescribed, and is a powerful and valuable antispasmodic.

ASTRINGENTS

Medicines, the primary effect of which is to diminish secretion and excretion, and which secondarily exert a tonic influence.

Astringents may be said to act in two ways—

1. By diminishing the alkalinity of the blood, they increase its coagulative tendency. (Acids.)

2. By causing condensation of albuminous tissues, and by inducing contraction of muscular fibre, they diminish the calibre of capillary vessels and of the ducts of glands. Whenever a prolonged course of astringents is required, their administration should be stopped at intervals.

The following are the chief Astringents, arranged in alphabetical order—

Acid. Acet. Dil. ℥xxx.—ʒii.

Oxymel. ʒi.—ii.

Acid. Carbolic. gr. i.—iii.

Glycerinum. ℥v.—xv.

Suppositoria Acid. Carbolic. cum Sapone.

Trochisci. i—3.

Acid. Hydrochlor. Dil.

Acid. Nitric. Dil.

Acid. Nitro-Hydrochlor. Dil.

Acid. Phosph. Dil.

Acid. Sulphuric. Aromat.

Acid. Sulphuric. Dil.

} ℥v.—xx.

- Alumen. gr. v.—x.
Alumen Exsiccatum.
Glycerinum. ℥xxx.—℥i.
- Catechu. gr. v.—xv.
Pulvis Comp. gr. x.—xl.
Tinctura. ℥xxx.—℥i.
Trochisci. i—3.
- Creosotum. ℥i.—v.
Mistura. ℥ss.—i.
Unguentum.
- Creta Præparata. gr. x.—℥i.
Mistura. ℥ss.—i.
Pulv. Cretæ Aromat. gr. x.—℥i.
Pulv. Cretæ Aromat. cum Opio. gr. x.—xl.
- Cupri Sulphas. gr. ¼—ii.
- Ergota. gr. xx.—℥i.
Extract. gr. ii.—viii.
Extract. Liquid. ℥x.—xxx.
Infusum. ℥i.—ii.
Tinctura Ammoniata. ℥xxx.—℥i.
Inject. Hypoderm. ℥iiii.—x.
- Eucalypti Gummi. gr. ii.—v.
Trochisci. i—3.
- Ferri Perchlor. Liquor. }
 Ferri Perchlor. Tinct. } ℥v.—xv.
 Ferri Pernitrat. Liquor. }
- Ferri Sulphas. gr. i.—v.
Ferri Sulphas Exsiccatus. gr. ½—iii.
- Galla.
Unguentum.
Unguentum Gallæ cum Opio.
Acid. Gallic. gr. v.—xv.
Acid. Tannic. gr. ii.—v.
Glycerinum. ℥x.—xxv.
Suppositoria.
Trochisci. i—6.
- Hæmatoxyli Lignum.
Decoctum. ℥ss.—ii.
- Hamamelidis Cortex.
Tinctura. ℥xxx.—℥i.
- Hamamelidis Folia.
Extract. Liq. ℥v.—xv.
Liquor.
Unguentum.

i. Order a gargle to

Hydrastis Rhizoma.

Tinctura. ℥xxx.—ʒi.

Extract. Liq. ℥v.—xv.

Kino. gr. v.—xx.

Pulvis Comp. gr. v.—xx.

Tinctura. ℥xxx.—ʒi.

Krameria Radix.

Extractum. gr. v.—xv.

Infusum. ʒss.—i.

Liq. Concent. ℥xxx.—ʒi.

Tinctura. ℥xxx.—ʒi.

Trochisci. i—3.

Troch. Kram. et Cocain. i—3.

Plumbi Acetas. gr. i.—v.

Pil. Plumbi cum Opio. gr. iv.—viii.

Suppos. Plumbi Comp.

Unguent. Plumbi Acet.

Plumbi Carbonas.

Unguent. Plumbi Carb.

Plumbi Oxidum.

Emplastrum.

Plumbi Subacetatis Liquor Fortis.

Liquor Plumbi Subacet. Dilut.

Glycerinum Plumbi Subacet.

Rosæ Gallicæ Petala.

Confectio.

Infusum Rosæ Acidum. ʒss.—i.

Syrupus. ℥xxx.—ʒi.

Sodii Biboras (Borax). gr. v.—xx.

Mel Boracis.

Glycerinum Boracis. ℥xxx.—ʒi.

Uvæ Ursi Folia.

Infusum. ʒss.—i.

Zinci Acetas. gr. i.—ii.

Zinci Carbonas. gr. i.—v.

Zinci Oxidum. gr. iii.—x.

Unguentum.

Zinci Sulphas. gr. i.—iii.

1. Order a gargle to contain Dilute Acetic Acid.

R

Acidi Acetici Diluti, ℥ii.
 Mellis Depurati, ℥i.
 Aquæ, ℥vii.
 Misce. Fiat gargarisma, sæpe in die utendum.

2. Order a mixture to contain Carbolic Acid.

R

Glycerini Acidi Carbolici, ℥i.
 Spiritus Juniperi, ℥viii.
 Aquæ, ad ℥viii.
 Misce. Fiat mistura, cujus capiat cochlearia duo magna sextis horis.

The glycerin of carbolic acid affords a very eligible form for the internal administration of that drug. The addition of spirit of juniper, as in the *Mistura Creosoti*, will help to conceal the taste.

3. Prescribe a mixture containing one of the dilute mineral acids.

R

Acidi Nitrici diluti, ℥ii.
 Syrupi Aurantii, ℥iiss.
 Infusi Quassiae, ad ℥vi.
 Misce. Fiat mistura, de qua sumatur uncia quartis horis.

It is a good rule, in administering the dilute mineral acids internally, to give them in combination with a vegetable tonic.

4. Order a Nitro-muriatic Acid bath.

R

Acidi Nitrici, ℥iiss.
 Acidi Hydrochlorici, ℥iii.
 Aquæ calidæ, cong. xv.
 Misce. Fiat balneum.

The prescriber should give directions for this bath to be prepared in a wooden vessel. The patient should remain in it for about fifteen or twenty minutes.

6. Prescribe Creosote
 R
 Creosoti, ℥vi.
 Mucilaginis Acacie.
 Aquæ Comp. ℥i. ana ℥viii.
 Misce. Fiat mistura. Capiat
 ad tertius horis.
 Creosote is rendered
 large. The *Mistura Creosoti*
 an excellent form for the
 Silver oxide is believed
 astringent in internal hæ-
 morrhage. It is thought desirable to com-
 bined with a vegetable tonic. It must be
 Silver oxide be first mi-
 nistered in powder, the
 7. Prescribe a mixture
 Laudanum, and Chalk.
 R
 Tinctura Camphoræ, ℥v.
 Tinctura Opii, ℥i.
 Mistura Creosoti, ad ℥v.
 Misce. Fiat mistura.
 per singulos dies tertius horis.

5. Prescribe a mixture to contain Alum.

R

Aluminis, ℥ii.

Syrupi Rosæ, ℥i.

Infusi Rosæ Acidi, ℥vii.

Misce. Fiat mistura. Sumat cochlearia duo ampla tertiis horis.

The alum is readily soluble in the acid infusion of roses.

Exsiccated alum is intended for external use only.

6. Prescribe Creosote in mixture.

R

Creosoti, ℥vi.

Mucilaginis Acaciæ,

Aquæ Camphoræ, ana ℥iii.

Misce. Fiat mistura. Capiat cochlearia duo magna secundis vel tertiis horis.

Creosote is rendered emulsive with water by mucilage. The *Mistura Creosoti* of the Pharmacopœia is an excellent form for the administration of creosote.

Silver oxide is believed by some to be a valuable astringent in internal hæmorrhages, and it might be thought desirable to combine it with creosote in the form of pill. It must be remembered that unless the silver oxide be first mixed with liquorice or some other diluent powder, the mass will take fire.

7. Prescribe a mixture of Tincture of Catechu, Laudanum, and Chalk.

R

Tincturæ Catechu, ℥v.

Tincturæ Opii, ℥i.

Misturæ Cretæ, ad ℥viii.

Misce. Fiat mistura, cujus sumantur cochlearia duo magna post singulas dejectiones liquidas.

Chalk mixture is very generally employed as a vehicle for more active astringents.

8. Order a mixture of Tincture of Ferric Chloride in a tonic vegetable infusion.

R

Tincturæ Ferri Perchloridi, ℥ii.

Syrupi Simplicis, ℥vi.

Infusi Quassiae, ℥v.

Misce. Fiat mistura. Capiat cochlearia duo magna sextis horis.

Infusions of quassia and calumba may be prescribed with salts of iron, but astringent vegetable infusions, and infusions of cascarilla, chamomile, chiretta, cinchona, cloves, cusparia, digitalis, gentian, hops, and orange, are turned brown or black with soluble preparations of iron.

9. Order half a dozen pills of Ferrous Sulphate.

R

Ferri Sulphatis Exsiccati, gr. xviii.

Mannæ, gr. xii.

Misce. Fiat massa, in pilulas sex dividenda. Capiat unam bis in die.

The "dried" sulphate is preferable for administration in the form of pill, as three grains of it are equal to five of the crystallised salt. Manna, though not now official, is an excellent excipient (*Squire*).

10. Prescribe pills of Gallic Acid.

R

Acidi Gallici, ℥i.

Glycerini, ℥viii.

Misce. Fiant pilulæ sex; quarum capiat unam ter in die.

If it be required to administer gallic acid in a liquid

form, it must be dissolved in an aqueous liquid by the aid of glycerin, or suspended by mucilage; tannic acid, being extremely soluble in water, does not require any such procedure.

11. Order a mixture to resemble the *Pilula Plumbi cum Opio* (B. P.)

℞
Plumbi Acetatis, gr. xxiv.
Morphinæ Acetatis, gr. i.
Acidi Acetici Diluti, ℥iv.
Aquæ Distillatæ, ad ℥viii.
Misce. Fiat mistura. Capiat cochlearia duo magna tertiâ quâque horâ.

In this case we select morphine acetate in preference to tincture of opium, as the latter preparation gives with lead acetate a precipitate of lead meconate. The object of the dilute acetic acid is to prevent the conversion of the lead acetate into lead carbonate.

12. Prescribe a gargle of Borax.

℞
Glycerini Boracis, ℥ii.
Aquæ, ℥vi.
Misce. Fiat gargarisma, sæpe utendum.

The prescriber might possibly select the acid infusion of roses as the vehicle in this case, but the result would be an unsightly green mixture. The acid infusion of roses, however, forms an excellent vehicle for alum gargles.

13. Prescribe an injection of Zinc Sulphate.

℞
Zinci Sulphatis, gr. viii.
Aquæ, ℥iv.
Misce. Fiat injectio, quæ in urethram injiciatur mane et nocte.

CATHARTICS

Cathartics may be defined as medicines which accelerate or increase the intestinal evacuations.

They differ as to their mode, degree, and sphere of action. With regard to their *mode of action*, some cathartics act by increasing the peristaltic motion, others by increasing the mucous secretion, and others by increasing the supplementary intestinal secretions, e.g. the bile.

Cathartics are divided into several classes according to their *degree of action*—

1. *Laxatives*—cathartics which operate very mildly, and which, while they slightly increase the peristaltic motion, do not increase the amount of secretion.
2. *Simple Purgatives* differ from laxatives in causing a greater increase of peristaltic motion, and also in causing a slight increase of secretion.
3. *Drastic Purgatives* differ from simple purgatives only in degree of action.
4. *Hydragogue Purgatives* increase the secretion to such an extent as to produce a watery evacuation.
5. *Saline Purgatives* produce an effect similar to, but slighter than, the hydragogue purgatives, and are not drastic in their action.
6. *Cholagogue Purgatives* produce a flow of bile into the intestine.

Cathartics differ as to their *sphere of action*. Some act on the large intestine, some on the small intestine, and some on the entire canal.

The chief objects sought to be effected by purgatives are—

1. To unload the bowel.

1. To increase the secretion of the intestinal glands.
 2. To relieve the congestion of the vessels, including the veins of the liver.
 3. To produce a derangement of the system.
 4. To produce a derangement of the system.
 Probably there is no class of cathartics which is so useful as in the treatment of several different purgatives, and which are advantageous than the administration of some substances, as laxatives, which are combined with purgatives, to increase the peristaltic motion to the intestine; other secretions, and are for this reason called cathartics. Not infrequently the griping properties of this may be effected by the administration of stramonium, henbane, or opium.
 The prescriber should consider the day for the administration of the medicine, the active principle of the drug, and the time when the medicine is slow to act, given at night; salines should be given in the morning.

LAXATIVES
 Cassia Pulpa. ʒi. — ʒi. — ʒi.
 Glycerium. Supposito.
 Magnes.
 Magnes. Lev.
 Magnes. Carbonas.
 Magnes. Carbonas. Lev.
 Liq. Magnes. Carbonas.
 Mel. Depuratum.
 Oleum Oliva. ʒi. — ʒi.

2. To increase the secretion of the neighbouring intestinal glands.
3. To relieve congestion of internal organs by unloading the veins of the canal.
4. To produce a derivative effect.

Probably there is no class of medicines in which *combination* is so useful as in cathartics. Combination of several different purgatives will often be found more advantageous than the administration of a single drug. Some substances, as nux vomica and ferrous sulphate, are combined with purgatives with the object of giving tone to the intestine; other substances, as ipecacuanha and antimonial preparations, increase the mucous secretion, and are for this reason often combined with cathartics. Not infrequently it will be necessary to correct the griping properties of some purgatives, and this may be effected by the addition of belladonna, stramonium, henbane, aromatic oils, etc.

The prescriber should carefully attend to the *time of day for the administration* of cathartics. Where the active principle of the drug employed is resinous, or when the medicine is slow in action, it should be given at night; salines should be administered in the morning.

LAXATIVES

Cassiae Pulpa. ℥ii.—*upw.* Ficus.
 Glycerinum. *Suppositoria.*
 Magnesia.
 Magnesia Levis. } gr. xxx.—℥i.
 Magnesii Carbonas.
 Magnesii Carbonas Levis. }
 Liquor Magnesii Carbonatis. ℥i.—ii.
 Mel Depuratum.
 Oleum Olivæ. ℥i.—℥i.

Oleum Ricini. ʒi.—ʒi. *Mistura.* ʒi.—ii.
 Prunum.
 Sulphur Sublimatum. gr. xx.—ʒi.
 Confectio. ʒi.—ii.
 Sulphur Præcipitatum. gr. xx.—ʒi. *Trochisci.* i—6.
 Tamarindus.

SIMPLE PURGATIVES

Aloe Barbadosis. gr. ii.—v.
 Aloinum. gr. ½—ii.
 Extractum Aloes Barb. gr. i.—iv.
 Pilula Aloes Barb. gr. iv.—viii.
 Pilula Aloes et Ferri. gr. iv.—viii.
 Tinctura Aloes. ʒss.—ii.
 Decoctum Aloes Comp. ʒiv.—ʒii.
 Aloe Socotrina. gr. ii.—v.
 Pilula Aloes Socot.
 Pilula Aloes et Asafetidæ. } gr. iv.—viii.
 Pilula Aloes et Myrrhæ. }
 Cascara Sagrada.
 Extract. gr. ii.—viii.
 Extract. Liquid. ʒss.—i.
 Syrupus Casc. Arom. ʒss.—ii.
 Jalapa. gr. v.—xx.
 Resina. gr. ii.—v.
 Extractum. gr. ii.—viii.
 Pulvis Jalapæ Comp. gr. xx.—ʒi.
 Tinctura. ʒss.—i.
 Rhei Radix. gr. xv.—xxx.
 Extractum. gr. ii.—viii.
 Infusum. ʒss.—i.
 Pilula Rhei Comp. gr. iv.—viii.
 Pulvis Rhei Comp. gr. xx.—ʒi.
 Syrupus. ʒss.—ii.
 Tinctura Comp. ʒii.—iv.
 Liquor Concent. ʒss.—i.
 Senna.
 Confectio. ʒi.—ii.
 Infusum. ʒi.—ii.
 Mistura Sennæ Comp. ʒi.—ii.
 Tinctura Comp. ʒii.—iv.
 Syrupus. ʒss.—ii.
 Liquor Concent. ʒss.—i.
 Pulvis Glycyrrhizæ Comp. ʒi.—ii.

DRASTIC PURGATIVES

- Cambogia. gr. $\frac{1}{2}$ —ii.
Pilula Cambogiae Co. gr. iv.—viii.
 Colocynthis Pulpa.
Extractum Colocynthis Co. gr. ii.—viii.
Pilula Colocynthis Co. gr. iv.—viii.
Pilula Colocynthis et Hyoscyami. gr. iv.—viii.
 Crotonis Oleum. $\text{m}\frac{1}{3}$ —i.
 Jalapa.
Vide "Simple Purgatives."
 Scammoniae Radix.
 Scammonium. gr. v.—x.
Pulvis Scammonii Co. gr. x.—xx.
 Scammoniae Resina. gr. iii.—viii.
Pilula Scammonii Co. gr. iv.—viii.

HYDRAGOGUE PURGATIVES

- Cambogia.
Vide "Drastic Purgatives."
 Elaterium. gr. $\frac{1}{10}$ — $\frac{1}{2}$.
Elaterinum. gr. $\frac{1}{40}$ — $\frac{1}{10}$.
Pulvis Comp. gr. i.—iv.
 Potassii Tartras Acidus. ʒ ii.—iv.

SALINE PURGATIVES

- Magnesii Sulphas. ʒ ii.—iv.
Effervescens. ʒ ss.—i.
 Potassii Sulphas. gr. xx.— ʒ ii.
 Potassii Tartras. ʒ ii.—iv.
 Potassii Tartras Acidus. ʒ ii.—iv.
 Soda Tartarata. ʒ ii.—iv. *Pulv. Effervescens.*
 Sodii Phosphas. ʒ ii.—iv. *Effervescens.* ʒ ii.—iv.
 Sodii Sulphas. ʒ ii.—iv. *Effervescens.* ʒ ii.—iv.

CHOLAGOGUE PURGATIVES

- Aloe. *Vide "Simple Purgatives."*
 Euonymi Cortex. *Extractum siccum.* gr. i.—ii.
 Hydrargyri Subchloridum. gr. $\frac{1}{2}$ —v.
 Hydrargyri Pilula. gr. iv.—viii.
 Hydrargyrum cum Cretâ. gr. i.—v.

Podophylli Rhizoma.

Resina. gr. ʒ—i.

Tinctura. ℥ v. — xv.

Taraxacum. Ⅲv.—xv.

Extractum. gr. v. — xv.

Extract. Liquid. ʒss.—ii.

Succus. ʒi.—ii.

1. Prescribe pills containing Aloes.

R:

Extracti Aloes Barbadensis, gr. xxiv.

Pulveris Ipecacuanhæ, gr. vi.

Extracti Gentianæ, quantum sufficiat ut fiant pilulæ duodecim.

Una ante prandium sumenda.

The pill form is well adapted for the administration of aloes on account of the extremely bitter taste of this drug. In the liquid form its taste is well concealed by liquorice. In the above prescription we have ordered the *extract* of aloes, as it is more active, and acts more pleasantly than aloes itself. The prescriber will do well to remember that the purgative effects of aloes are increased by bitter tonics. Aloes should not be given during pregnancy, or when there are hæmorrhoids, as it acts chiefly on the lower bowel.

2. Prescribe Gamboge in mixture.

R4

Cambogiæ, gr. xxiv.

Liquoris Ammoniaë, ʒii.

Tere simul, et adde

Syrupi Zingiberis, ꝑiss.

Aquæ Menthæ Piperitæ, ad ℥vi.

Misce. Fiat mistura. Capiat cochleare magnum tertiâ quâque horâ donec plene responderit alvus.

The foregoing prescription indicates several important points concerning the administration of gamboge. It shows that gamboge may be given in the liquid

form in emulsion or alkaline solution, and it illustrates the fact that it is advisable to combine with it some aromatic, such as ginger. Gamboge is generally advantageously combined with other cathartics, as calomel, jalap, elaterium, acid potassium tartrate, etc.

3. Prescribe half a dozen pills, each to contain two grains of Compound Extract of Colocynth, two grains of Compound Rhubarb Pill, and one grain of Blue Pill.

R

Extracti Colocynthidis Compositi, gr. xii.

Pilulæ Rhei Compositæ, gr. xii.

Pilulæ Hydrargyri, gr. vi.

Misce. Divide in pilulas sex. Capiat duas pro re natâ.

Colocynth should always be prescribed in combination with other cathartics on account of its drastic properties.

4. Prescribe Croton Oil.

R

Olei Crotonis, ℥ii.

Micæ panis quantum sufficiat ut fiat pilula. Statim sumenda, et post horas duas repetenda si opus sit.

Croton oil should not be administered in the liquid form.

5. Order pills each to contain 1-16th of a grain of Elaterium.

R

Pulveris Elaterii, gr. i.

Pulveris Sacchari Lactis, gr. xvii.

Extracti Gentianæ, quantum sufficiat ut fiat massa, in pilulas sexdecim dividenda e quibus capiat unam ut opus sit.

The foregoing prescription illustrates the important principle that very active substances, the dose of which

is very small, should be "diluted" with some inert powder, so as to ensure accurate division. This is exemplified by the *Pulvis Elaterini Compositus* of the Pharmacopœia.

6. Prescribe Calomel in pills.

R

Hydrargyri Subchloridi, gr. xii.
Mannæ, gr. vi.
Pulveris Tragacanthæ Compositi, gr. vi.
Misce. Divide in pilulas sex; capiat duas pro re natâ.

This is the method of making calomel into pills recommended by Mr. Squire. Pills of calomel made with mucilage become very hard on keeping, and if made with a conserve they are apt to become moist. Calomel is incompatible with alkalies, and hence soap is unsuited as an excipient.

7. Give the formulæ for the ordinary "Black," "White," and "Red" Mixtures of Hospitals.

R

Magnesii Sulphatis, ℥iss.
Extracti Glycyrrhizæ, ℥ii.
Tincturæ Sennæ Compositæ, ℥i.
Tincturæ Cardamomi Compositæ, ℥iv.
Infusi Sennæ ad ℥viii.
Misce. Fiat mistura. Sumat cochlearia duo magna quartis horis ad effectum.

R

Magnesii Sulphatis, ℥ii.
Magnesii Carbonatis, ℥ii.
Syrupi Zingiberis, ℥i.
Aquæ Menthæ Piperitæ, ad ℥viii.
Misce. Fiat mistura. Sumat cochlearia duo magna quartis horis ad effectum, phialâ prius bene agitâtâ.

R

Magnesii Sulphatis, ℥ii.
Infusi Rosæ Acidi, ℥viii.

Misce. Fiat mistura. Sumat cochlearia duo magna ad effectum.

These are also frequently prescribed in the form of draught to be taken in the morning.

Free dilution aids the action of magnesium sulphate. Tincture of an aromatic bitter, as of cascarrilla, calumba, or orange-peel, may be added to hide the taste, but the acid infusion of roses, as in the last prescription, is best adapted for this purpose. Magnesium sulphate may be prescribed with the alkaline *bi-carbonates*, but is incompatible with carbonates of the alkalies. If magnesium sulphate be mixed with solution of Rochelle Salt, a not unlikely combination, magnesium tartrate will be precipitated after a time. The "effervescent sulphate" is therefore granulated.

8. Prescribe Jalap in combination with Cream of Tartar in the form of draught.

R

Pulveris Jalapæ, gr. xx.
Potassii Tartratis Acidi, ℥i.
Syrupi Zingiberis, ℥ii.
Aquæ Menthæ Piperitæ, ℥iss.

Misce. Fiat haustus, mane sumendus, phialâ prius agitâtâ.

The above is a very useful combination. Jalap is also frequently combined with calomel or scammony. Some aromatic, as ginger, should be added to jalap to counteract the griping tendencies of the latter.

We may here mention that the solubility of cream

of tartar is greatly increased by the addition of one-fourth of its weight of boracic acid or borax.

9. Prescribe an Enema to consist of Olive Oil and a decoction of barley.

R

Olei Olivæ, ℥ii.

Mucilaginis Acaciæ, ℥i.

Decocti Hordei (℥ii. ad Oi.), ℥x.

Tere oleum cum mucilagine donec probè coiverint, tum sensim adde decoctum, ut fiat enema (*Percira*).

10. Prescribe a mixture to contain Epsom Salts, a Salt of Iron, and a Bitter Tonic.

R

Magnesii Sulphatis, ℥ii.

Ferri Sulphatis, gr. xxiv.

Acidi Sulphurici Diluti, ℥ii.

Infusi Calumbæ ad ℥viii.

Misce. Fiat mistura. Capiat cochlearia duo magna omni mane.

This prescription scarcely calls for comment. Ferrous sulphate at once suggests itself to us as the most suitable salt for combination with magnesium sulphate. The acid aids materially in concealing the taste and in promoting the solubility of the salts. Infusion of calumba is one of the few bitter tonics which may be combined with iron.

11. Prescribe pills of Podophyllum Resin.

R

Podophylli Resinæ, gr. ii.

Extracti Belladonnæ Alcoholici, gr. iii.

Pilulæ Colocynthidis Compositæ, gr. xxxvi.

Misce. Fiant pilulæ duodecim; quarum capiat unam nocte quoties alvus fuerit justo adstrictior.

Resin of podophyllum is generally prescribed in this country. It must be remembered that podophyllum varies greatly in its action on individuals; it is therefore well to commence its administration in small doses. Common salt greatly increases its purgative effect, while lactic acid modifies its action.

12. Prescribe a Rhubarb draught.

R

Pulveris Rhei, gr. xxx.
Sodii Bicarbonatis, gr. xv.
Spiritus Myristicæ, ℥vi.
Syrupi Zingiberis, ℥i.
Aquæ Menthæ Piperitæ, ad ℥iss.
Misce. Fiat haustus, nocte sumendus.

Sodium bicarbonate counteracts the astringency and covers the taste of rhubarb; spirit of nutmeg and peppermint water also conceal its taste. I may here mention that potassium sulphate increases the purgative effect of rhubarb.

13. Prescribe twelve pills, each to contain two grains of Compound Rhubarb Pill, one grain of Blue Pill, one grain of Dried Carbonate of Sodium, and one grain of Extract of Henbane.

R

Pilulæ Rhei Compositæ, gr. xxiv.
Pilulæ Hydrargyri, gr. xii.
Sodii Carbonatis Exsiccati, gr. xii.
Extracti Hyoscyami, gr. xii.
Misce et divide in pilulas duodecim. Sumat duas horâ decubitûs.

This formula for an aperient pill for ordinary constipation was recommended by the late Dr. Neligan.

14. Prescribe Castor Oil in draught so as to conceal its taste as much as possible. Cf. *Mistura* (B.P.).

R

Olei Ricini, ℥vi.
Olei Limonis, ℥x.
Olei Myristicæ, ℥ii.
Syrapi Simplicis, ℥ss.
Liquoris Potassæ, ℥i.
Aque Aurantii Floris, ℥i.

Misce. Fiat haustus (*Macnamara*).

15. Prescribe Scammony in combination with Calomel.

R

Pulveris Scammonii, gr. iv.
Hydrargyri Subchloridi, gr. iii.
Potassii Sulphatis, gr. iv.
Pulveris Zingiberis, gr. v.

Misce. Fiat pulvis catharticus.

Scammony and calomel form a very useful combination, and scammony may also be advantageously combined with other vegetable purgatives. Potassium sulphate corrects its action, and ginger prevents its tendency to gripe. Scammony resin may be well given made into an emulsion with milk, as in the old *Mistura Scammonii*, a preparation specially adapted for children.

16. Prescribe Sodium Phosphate.

R

Sodii Phosphatis, ℥ss.
Fiat pulvis, in pulmento sumendus.

Sodium phosphate is almost tasteless when administered in mutton broth, or in effervescent form.

17. Write the formula for a Seidlitz Powder (B.P.).

R

Sodæ Tartaratæ, ʒii.
Sodii Bicarbonatis, gr. xl.
Misce, ut fiat haustus effervescens cum
Acidi Tartarici, gr. xxxviii.
Aquæ, ʒviii.

DIAPHORETICS

Medicines which increase the cutaneous secretion.

Diaphoretics may be divided into two classes, *Stimulant* and *Sedative*. The former act by stimulating the cutaneous capillaries and general vascular system; the latter by relaxing morbid constriction of the cutaneous vessels. The first are indicated when the circulation is slow and languid; while the sedative diaphoretics are indicated when the skin is hot and there are febrile disturbances present. Some diaphoretics, as opium, primarily exert a stimulant action, which is followed by a sedative and relaxing effect.

Probably certain diaphoretics especially aid in the elimination of water from the system, while others chiefly promote the secretion by the skin of certain organic and inorganic matters from the blood.

The following are the chief applications of diaphoretics—

1. To restore the action of the skin when it has been checked from any cause.
2. To increase the action of the skin in certain cutaneous diseases.
3. To relieve the kidneys.
4. To determine blood to the surface in fever.

The action of diaphoretics will be aided by exercise; baths, either of warm water, vapour, or warm air; and tepid diluent drinks. Cold affusion and wet sheet packing are not infrequently resorted to for the production of diaphoresis.

During the administration of diaphoretics the surface of the body should be kept warm.

The diaphoretics in most common use are—

STIMULANT

Ammonii Acetatis Liquor. ʒii.—vi.

Ammonii Citratis Liquor. ʒii.—vi.

Guaiaci Resina. gr. v.—xv.

Mistura. ʒss.—i.

Tinctura Guaiaci Ammoniata. ℥xxx.—ʒi.

Jaborandi Folia.

Extractum Liquidum. ℥v.—xv.

Tinctura. ʒss.—i.

Pilocarpinae Nitras. gr. ʒd—½.

Mezeri Cortex.

Opium.

Vide "Narcotics."

Pulvis Ipecacuanha Compositus. gr. v.—xv.

Sarsæ Radix.

Liquor Sarsæ Comp. Concent. ʒii.—ʒi.

Extractum Liquidum. ʒii.—iv.

Sassafras Radix.

Senegæ Radix. gr. xv.—xx.

Infusum. ʒss.—i.

Tinctura. ʒss.—i.

Liquor Concent. ʒss.—i.

Serpentariæ Rhizoma.

Infusum. ʒss.—i.

Tinctura. ℥xxx.—ʒi.

Liquor Concent. ʒss.—ii.

SEDATIVE

Antimonii Oxidum. gr. i.—ii.

Pulvis Antimonialis. gr. iii.—vi.

Antimonium Sulphuratum. gr. i.—ii.
 Antimonium Tartaratum. gr. $\frac{1}{4}$ — $\frac{1}{8}$.
Vinum Antimoniale. ℥x.—xxx.
 Ipecacuanha.
Vide "Expectorants," etc.
Pulvis Ipecacuanhe Compositus. gr. v.—xv.

1. Write a formula for a mixture to contain Min-
 dererus's Spirit, Antimonial Wine, Syrup of Roses,
 and Camphor Water.

R

Liquoris Ammonii Acetatis, ℥ii.
 Vini Antimonialis, ℥iss.
 Syrupi Rosæ, ℥vi.
 Aquæ Camphoræ, ℥iii.

Misce. Fiat mistura. Capiat cochlearia duo magna tertiis
 horis.

Liquor ammonii acetatis, if given in too large
 doses, will act as a diuretic, and not as a diaphoretic.
 A mixture of sweet spirit of nitre with it forms a very
 useful combination.

2. Prescribe a mixture to consist of Ammonium
 Citrate and Serpentry.

R

Liquoris Ammonii Citratis, ℥ii.
 Syrupi Limonis, ℥vi.
 Tincturæ Serpentariæ, ℥ii.
 Infusi Serpentariæ, ℥iii.

Misce. Fiat mistura. Capiat cochlearia duo magna secundis
 horis.

The combination of the tincture and infusion of
 serpentry in the foregoing prescription will serve
 to illustrate the fact that we may frequently obtain a
 more certain effect by combining different preparations
 of the same substance.

3. Write a prescription for pills each to contain two and a half grains of "James's Powder" and the same amount of "Dover's Powder."

R

Pulveris Antimonialis, gr. xv.
Pulveris Ipecacuanhæ Compositi, gr. xv.
Confectionis Rosæ Gallicæ, quantum sufficit ut fiat massa, in pilulas sex dividenda, e quibus sumantur duæ vel tres omni nocte.

4. Prescribe pills of Opium, Ipecacuanha, and Camphor.

R

Pulveris Opii, gr. i.
Pulveris Ipecacuanhæ, gr. i.
Camphoræ, gr. ii.
Spiritus Rectificati, ℥i.
Fiat pilula, horâ somni sumenda.

Ipecacuanha and camphor both increase the diaphoretic action of opium.

5. Prescribe the Ammoniated Tincture of Guaiacum.

R

Tincturæ Guaiaci Ammoniatæ, ℥iv.
Mucilaginis Acaciæ, ℥iv.
Tere simul, et adde
Infusi Senegæ, ℥ii.
Misce. Fiat mistura. Capiat cochleare magnum bis in die.

Ammoniated tincture of guaiacum, being one of those which are precipitated by aqueous liquids, requires to be emulsified.

6. Write a formula to represent the "Chelsea Pensioner's Mixture."

R

Resinæ Guaiaci, ℥iv.
Potassii Tartratis Acidi, ℥i.
Sulphuris Sublimati, ℥ii.
Pulveris Rhei, ℥i.
Pulveris Zingiberis, ℥iv.
Pulveris Myristicæ, ℥ii.
Mellis Depurati, quantum sufficit ut fiat electuarium, de quo
capiat cochlearia duo parva nocte et mane.

DIURETICS .

Medicines which promote the secretion of the urine by increasing the function of the kidneys.

Some diuretics act *directly* on the secreting structure of the gland, others act *indirectly*.

The following are the chief therapeutic applications of diuretics—

1. To increase the flow of urine when it is deficient in quantity.
2. To eliminate poisons from the blood.
3. To diminish irritation of the genito-urinary organs.
4. To prevent the deposition of calculi or gravel in the urinary passages.

Whenever a simply diuretic effect is desired, the surface of the body should be kept cool, and purging should be carefully avoided.

The following are the chief diuretics—

Ætheris Nitrosi Spiritus. ℥xxx.—℥ii.

Buchu Folia.

Infusum. ℥i. —ii.

Tinctura. ℥xxx.—℥i.

Cantharis.

Tinctura. ℥v.—xv. (single dose).

- Digitalis Folia. gr. $\frac{1}{2}$ —ii.
Infusum. \mathfrak{z} ii.—iv.
Tinctura. \mathfrak{m} v.—xv.
 Ethyl Nitritis Liquor. \mathfrak{m} xx.— \mathfrak{z} i.
 Juniperi Oleum. \mathfrak{m} ss.—iii.
Spiritus. \mathfrak{m} xx.— \mathfrak{z} i.
 Pareiræ Radix.
Extractum Liquidum. \mathfrak{m} xxx.— \mathfrak{z} ii.
 Potassii Acetas. gr. x.— \mathfrak{z} i.
 Potassii Tartras Acidus. gr. xx.— \mathfrak{z} i.
 Potassii Nitrates. gr. v.—xx.
 Scillæ. gr. i.—iii.
Acetum. \mathfrak{m} x.—xxx.
Oxymel. \mathfrak{m} xxx.— \mathfrak{z} i.
Pilula Scillæ Composita. gr. iv.—viii.
Syrupus. \mathfrak{m} xxx.— \mathfrak{z} i.
Tinctura. \mathfrak{m} v.—xv.
 Senegæ Radix.
Infusum. \mathfrak{z} ss.—i.
Tinctura. \mathfrak{m} xxx.— \mathfrak{z} i.
Liquor Concent. \mathfrak{m} xxx.— \mathfrak{z} i.
 Scoparii Cacumina.
Infusum. \mathfrak{z} i.—ii.
Succus. \mathfrak{z} i.—ii.
 Sodii Biboras (Borax). gr. v.—xx.
Mel Boracis.
Glycerinum Boracis. \mathfrak{z} i.—ii.
 Terebinthinæ Oleum. \mathfrak{m} x.—xxx.
 Terebinthina Canadensis. gr. x.—xxx.
 Uvæ Ursi Folia. gr. x.—xxx.
Infusum. \mathfrak{z} ss.—i.

1. Order a mixture to contain Potassium Acetate and Digitalis.

R

Potassii Acetatis, \mathfrak{z} i. *or better. Caffeine Cit.*
 Tincturæ Digitalis, \mathfrak{z} i. *occasionally.*
 Infusi Digitalis, \mathfrak{z} ss.
 Aquæ Menthæ Piperitæ, ad \mathfrak{z} vi.
 Misce. Fiat mistura. Capiat cochlearia duo magna tertiâ quâque horâ.

This prescription illustrates the fact, to which allusion has already more than once been made, that a combination of different preparations of the same substance enhances its efficacy.

Digitalis has a *cumulative* action, a fact which must be carefully remembered when administering that drug. Patients under the full influence of digitalis are safe only in the horizontal posture.

2. Write a formula for a draught to contain Squill, Broom, and Senega.

R̄

Tincturæ Scille, ℥xv.
Succi Scoparii, ʒi.
Infusi Senegæ, ʒii.

Misce. Fiat haustus ad urinam movendam.

The above will be found an excellent combination. Senega resembles digitalis in its action, and may frequently be substituted for, or given alternately with, that drug, with excellent results.

3. Write a prescription for pills to contain Digitalis, Squill, and Calomel.

R̄

Pulveris Digitalis, gr. vi.
Pulveris Scillæ, gr. xii.
Pulveris Cretæ Aromatici, gr. xxiv.
Hydrargyri Subchloridi, gr. xii.
Confectionis Rosæ Gallicæ, quantum sufficit ut fiat massa,
in pilulas duodecim dividenda. Sumat unam sextâ quâque
horâ.

This is an imitation of "Baly's Pill."

4. Prescribe a mixture of Potassium Acetate, Squill, and Broom.

R

Potassii Acetatis, ℥iiss.

Aceti Scillæ, ℥iv.

Infusi Scoparii, ad ℥vi.

Misce. Fiat mistura. Capiat cochlearia duo magna quartis horis.

It will at once be seen that the *Acetum Scillæ* is the most eligible preparation of squill for combination with potassium acetate.

5. Prescribe a mixture to contain Sweet Spirit of Nitre, a Diuretic Salt of Potassium, and Broom.

R

Spiritus Ætheris Nitrosi, ℥ii.

Potassii Nitratis, gr. xx.

Infusi Scoparii, ℥iv.

Misce. Fiat mistura, cujus capiat unciam quater in die.

The student will readily recognise the propriety of prescribing potassium *nitrate* with the sweet spirit of nitre.

EMETICS

Medicines which cause vomiting. Emetics are termed *Direct* when they affect the mucous membrane of the stomach and cause reflex or eccentric vomiting. *Indirect* emetics are those which affect the nerve-centres and produce centric emesis. The former do not require to be absorbed, and hence as a rule act more promptly. The hypodermic injection of apomorphine acts quickly, without producing much nausea.

Emetics may also be divided into *Stimulating*, as ammonium carbonate and mustard, and *Depressing*, as tartar emetic and ipecacuanha. The degree of

muscular relaxation produced by an emetic is proportional to the amount of nausea which it creates.

The chief therapeutic applications of emetics are—

1. To unload the stomach.
2. To dislodge substances from the respiratory passages, as in bronchitis and croup.
3. To relieve portal and hepatic congestion not dependent on organic disease.
4. To produce muscular relaxation.
5. To reduce inflammation, as in the early stages of acute bronchitis.

Emetics should be used with great caution in cases where there is a tendency to determination of blood to the head, in disease of the heart and larger vessels, in hernia, in advanced pregnancy, and in prolapsus uteri. Emetics are also contra-indicated in gastric inflammation.

As a rule emetics should be given in a full dose ; but when protracted nausea is required the dose must be small and frequently repeated. The action of emetics is assisted by drinking tepid water.

The emetics in most frequent use are—

- Ammonii Carbonas. gr. xxx., *well diluted.*
 Antimonium Tartaratum. gr. i.—ii.
Vinum Antimoniale. ℥ii.—iv.
 Apomorphinæ Hydrochloridum.
Injectio Hypodermica. ℥v.—x.
 Cupri Sulphas. gr. v.—x.
 Ipecacuanha. gr. xv.—xxx.
Vinum. ℥iv.—vi.
 Sinapis. *A teaspoonful to a tablespoonful in tepid water.*
 Sodii Chloridum. *A tablespoonful or more.*
 Zinci Sulphas. gr. x.—xxx.

1. Prescribe a mixture of Tartar Emetic to produce emesis.

EMETICS

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 ipecacuanha and mustard, and *Depressing*, as
 tartar emetic and ipecacuanha. The degree of

℞

Antimonii Tartarati, gr. viii.

Aquæ destillatæ, ℥viii.

Misce. Fiat mistura. Capiat cochlearia duo magna subinde donec supervenerit vomitio.

When tartar emetic is given merely as a nauseant it should be combined with compound tincture of lavender, which has the property of restraining its emetic properties.

2. Write a prescription for a depressing emetic draught to consist of Tartar Emetic and Wine of Ipecacuanha.

℞

Antimonii Tartarati, gr. i.

Vini Ipecacuanhæ, ℥ii.

Aquæ destillatæ, ad ℥iss.

Misce. Fiat haustus emeticus, statim sumendus.

When powerful emetics are combined we must be careful to administer a small dose of each lest the effect produced by the combination be excessive.

3. Prescribe a stimulating emetic draught of Ammonium Carbonate.

℞

Ammonii Carbonatis, gr. xxx.

Aquæ, ℥ii.

Misce. Fiat haustus ad vomitum excitandum.

Ammonium carbonate when given as an emetic should be well diluted.

4. Prescribe a stimulating emetic draught of Mustard.

R

Sinapis, ℥i.

Aquæ tepidæ, ℥xvi.

Misce. Fiat haustus emeticus, statim sumendus.

Warm water aids the emetic action of mustard.

5. Prescribe an Emetic for a case of narcotic poisoning.

R

Zinci Sulphatis, gr. xxx.

Aquæ, ℥iii.

Misce. Fiat haustus emeticus, statim sumendus.

We prefer zinc sulphate to copper sulphate in cases of narcotic poisoning, because if the latter salt does not produce a speedy vomiting it may act as an irritant poison. If the stomach be partially paralysed by the narcotic, the administration of copper sulphate would be extremely inadvisable. In such a case apomorphine should be injected subcutaneously.

EMMENAGOGUES

Excitants of the catamenial flux. *Ecbolics* are substances which cause contraction of the uterus.

Emmenagogues are divided into *Direct*, those which are assumed to act on the uterus, and *Indirect*, those which act through the system. The iron salts, aloes, colocynth, and other strong purgatives, are examples of the latter class.

DIRECT EMMENAGOGUES

Ergota. gr. xx.—xxx.

Extractum. gr. ii.—iv.

Ergota—

Extractum Ergotæ Liquidum. ℥x.—xxx.*Infusum.* ℥i.—ii.*Tinctura Ammon.* ℥x.—xxx.Potassii Permanganas. gr. i.—ii., *in pill.*

ECBOLICS

Digitalis.

Infusum. }*Tinctura.* }} *Vide "Diuretics."*

Ergota.

Sodii Biboras (Borax).

Glycerinum Boracis. }*Mel Boracis.* }} *Vide "Diuretics."*

1. Prescribe Ergot and Aloes for amenorrhœa from atony of the uterus.

R

Tincture Ergotæ Ammoniatæ, ℥ii.

Decocti Aloes Compositi, ad ℥viii.

Misce. Fiat mistura, de quâ capiat cochlearia duo magna bis in die.

The indirect emmenagogues are often advisedly combined with one which acts directly on the uterus.

2. Prescribe a mixture of Borax and Ergot.

R

Sodii Biboratis, ℥ii.

Tincturæ Ergotæ Ammoniatæ, ℥ii.

Syrupi Aromatici, ℥i.

Aquæ Cinnamomi, ad ℥vi.

Misce. Fiat mistura. Capiat cochlearia duo magna sextis horis.

Dr. C. Brown of Pennsylvania, in a recent paper, speaks highly of a combination of ergot and borax.

3. Prescribe Ergot for a case of labour.

R

Pulveris Ergotæ, ʒi.
Sacchari, ʒiv.
Aquæ bullientis, ʒiii.

Misce. Capiat cochlearia duo magna omni quartâ parte horæ ad effectum.

4. Prescribe Potassium Permanganate for simple amenorrhœa.

R

Potassii Permanganatis, gr. xii.
Unguenti Resinæ, quantum sufficiat ut fiat massa, in pilulas sex dividenda, quarum una mane nocteque sumenda est.

Potassium permanganate must not be made up with any oxidisable organic excipient.

EMOLLIENTS

These soften the part to which they are applied, and diminish acrimony. We will refer at greater length to this class of therapeutic agents when we come to consider "External Applications."

The following substances exert an emollient or demulcent action—

Acaciæ Gummi. *Ad libitum.*
Mucilago. ʒi.—iv.
Adeps Præparatus. Adeps Lanæ.
Adeps Benzoatus. Adeps Lanæ Hydrosus.
Unguentum Simplex.
Amygdala Amara.
Amygdala Dulcis.
Mistura. ʒss.—i.
Pulvis Amygdalæ Compositus. ʒi.—ii.
Amygdalæ Oleum. ʒii.—iv.
Amylum.
Glycerinum.

Cera Alba.
 Cera Flava.
 Unguentum.
 Cetaceum.
 Unguentum.
 Collodium.
 Collodium Flexile.
 Ficus.
 Glycerinum. ℥xxx.—℥ii.
 Glycyrrhizæ.
 Extractum. gr. x.—xxx.
 Extractum Glycyrrhizæ Liquidum ℥xxx.—℥i.
 Hemidesmi Radix.
 Syrupi. ℥i.—ii
 Linum.
 Linum Contusum.
 Lini Oleum.
 Mel Depuratum.
 Olivæ Oleum. ℥i.—iv.
 Saccharum Purificatum.
 Syrupus.
 Saccharum Lactis.
 Sevum Preparatum.
 Tragacantha. gr. xx. upwards.
 Mucilago. ℥i. upwards.
 Pulvis Tragacanthæ Compositus. gr. xx.—℥i.
 Glycerinum.

One or two examples of formulæ for demulcents for internal use will suffice.

1. Prescribe a Demulcent Mixture to allay irritation from troublesome cough.

R

Extracti Glycyrrhizæ Liquidi, ℥ss.
 Syrupi Hemidesmi, ℥i.
 Mucilaginis Tragacanthæ, ℥i.
 Infusi Lini (℥ss. ad Oi.), ad ℥viii.
 Misce. Fiat mistura. Capiat cochleare magnum tussi urgente.

2. Prescribe a Demulcent Mixture for a case of *ardor urinæ*.

R
Tincturæ Hyoscyami, ʒiii.
Mellis Depurati, ʒv.
Mucilaginis Acaciæ, ʒi.
Decocti Hordei (ʒii. ad Oi.), ʒvi.
Misce. Fiat mistura. Capiat cochlearia duo magna subindè.

EXPECTORANTS

Agents which affect the pulmonary mucous membrane, and which increase or alter the character of its secretion.

Expectorants are divided into *Stimulant* and *Sedative*. The former are contra-indicated in cases attended with febrile disturbance.

STIMULATING EXPECTORANTS

Ammoniacum. gr. v.—xv.
Mistura. ʒiv.—ʒi.
Ammoniacæ Liquor. ℥x.—xxx.
Ammonii Carbonas. gr. iii.—x.
Spiritus Ammoniacæ Aromaticus. ℥xx.—xl.
Ammonii Chloridum. gr. v.—xv.
Balsamum Peruvianum. ℥x.—xv.
Balsamum Tolutanum. gr. x.—xv.
Syrupus. ℥xxx.—ʒi.
Tinctura. ℥xxx.—ʒi.
Benzoinum. gr. x.—xxx.
Acidum Benzoicum. gr. x.—xv.
Trochisci Acid. Benzoic. 1—3.
Tinctura Benzoini Composita. ℥xxx.—ʒi.
Copaiba. ℥xxx.—ʒi.
Copaibæ Oleum. ℥v.—xx.
Myrrha. gr. x.—xxx.
Pilula Aloes et Myrrhæ. gr. iv.—viii.
Tinctura. ℥xxx.—ʒi.
Pix Liquida. ℥x.—ʒi.
Scilla. gr. i.—iii.
Acetum. ℥x.—xxx.
Oxymel. ℥xxx.—ʒi.

Scilla—

Pilula Ipecacuanhæ cum Scillâ. gr. iv.—viii.*Pilula Scillæ Composita.* gr. iv.—viii.*Syrupus.* ℥xxx.—℥i.*Tinctura.* ℥v.—xv.

Senegæ Radix.

Infusum. ℥ss.—i.*Tinctura.* ℥xxx.—℥i.*Liquor Concent.* ℥xxx.—℥i.

Styrax Præparatus. gr. v.—x.

Terebenum. ℥v.—xv.

SEDATIVE EXPECTORANTS

Antimonii Oxidum. gr. i.—ii.

Pulvis Antimonialis. gr. iii.—vi.Antimonium Tartaratum. gr. $\frac{1}{2}$ — $\frac{1}{3}$.*Vinum Antimoniale.* ℥x.—xxx.Ipecacuanha. gr. $\frac{1}{2}$ —ii.*Pilula Ipecacuanhæ cum Scillâ.* gr. iv.—viii.*Pulvis Ipecacuanhæ Compositus.* gr. v.—xv.*Trochisci.* 1—3. *Vinum, Acetum.* ℥x.—xxx.

Lobelia.

Tinctura Lobeliæ Ætherea. ℥v.—xv.

Vapour of water, of chlorine, of ammonia, of iodine, of creosote, of turpentine, and of carbolic acid may be classed under Expectorants. Substances coming under the denomination of "Pulmonary Sedatives" will be referred to hereafter.

1. Prescribe a stimulating expectorant mixture to consist of Ammonium Carbonate, Squill, Tolu, and Senega.

℞

Ammonii Carbonatis, gr. xl.

Tincturæ Scillæ, ℥ii.

Syrupi Tolutani, ℥ii.

Infusi Senegæ, ℥vii.

Misce. Fiat mistura. Capiat cochlearia duo magna quartâ quâque horâ.

Ammonium carbonate should not be prescribed with *syrup* of squill, as this preparation contains acetic acid and decomposes the salt.

Squill may be very advantageously combined with ipecacuanha and ammoniacum.

2. Prescribe a mixture containing Benzoic Acid.

℞
Acidi Benzoici, ʒi.
Glycerini Boracis, ʒi.
Infusi Senggæ, ʒvii.
Misce. Fiat mistura. Sumat cochlearia duo magna quartis horis.

Benzoic acid should be administered in a large quantity of aqueous vehicle to prevent irritation of the fauces. Borax or sodium phosphate greatly increases its solubility. If it be desirable to administer the benzoic acid in pill, it will be well to remember that one minim of glycerin makes a good mass with five grains of the acid. When the compound tincture of benzoin is given internally it should be suspended by means of mucilage or yolk of egg.

3. Write a prescription for a child threatened with croup.

℞
Vini Ipecacuanhæ, ʒiii.
Syrupi Tolutani, ʒv.
Mucilaginis Acaciæ, ʒi.
Misce. Fiat mistura. Capiat cochleare parvum omni horâ vel secundâ quâque horâ (*Cheyne*).

4. Prescribe Lobelia and Stramonium for a case of spasmodic asthma.

℞
Tincturæ Lobeliæ Æthereæ, ʒii.
Tincturæ Stramonii, ʒii.

Spiritus Chloroformi, ℥iv.

Aquæ Camphoræ, ℥vii.

Misce. Fiat mistura, cujus capiat cochleare magnum quartâ quâque horâ.

Lobelia varies greatly in its effects on individuals ; hence it is a good rule always to commence its administration by small doses.

5. Prescribe pills of Tar.

R

Picis Liquidæ, ℥xxxvi.

Pulveris Glycyrrhizæ, q. s.

Fiat massa in pilulas duodecim dividenda, e quibus capiat tres ter in die.

NARCOTICS

Narcotics are medicines whose action on the nervous system is manifested by alleviation of pain (*Anodynes*), or by induction of sleep (*Soporifics* or *Hypnotics*).

Narcotics do not all exert a similar action ; some, as opium and Indian hemp, are capable of producing a powerful stimulant effect if administered in small and frequently repeated doses.

Idiosyncrasy, habit, and age should be carefully considered with reference to the administration of narcotics. Some individuals are peculiarly susceptible to their action. The activity of this class of drugs is greatly diminished by the frequency of their exhibition. The young are much more impressible than are adults by narcotics.

SOPORIFICS AND ANODYNES

Ammonii Bromidum. gr. v.—xxx.

Butyl-chloral Hydras. gr. v.—xx.

Cannabis Indica.

Extractum. gr. $\frac{1}{4}$ —i.

Tinctura. ℥v.—xv.

Chloral Hydras. gr. v.—xx. *Syrupus.* ʒss.—ii.

Hyoscinae Hydrobromidum. gr. $\frac{1}{200}$ — $\frac{1}{100}$.

Hyoscyaminae Sulphas. gr. $\frac{1}{200}$ — $\frac{1}{100}$.

Lupulus.

Infusum. ʒi.—ii.

Tinctura. ℥xxx.—ʒi.

Opium. gr. $\frac{1}{2}$ —ii.

Emplastrum.

Extractum. gr. $\frac{1}{4}$ —i.

Extractum Opii Liquidum. ℥v.—xxx.

Linimentum.

Pilula Saponis Composita. gr. ii.—iv.

Pilula Plumbi cum Opio. gr. ii.—iv.

Pilula Ipecacuanhæ cum Scillâ. gr. iv.—viii.

Pulvis Cretæ Aromaticus cum Opio. gr. x.—xl.

Pulvis Ipecacuanhæ Compositus. gr. v.—xv.

Pulvis Kino Compositus. gr. v.—xx.

Pulvis Opii Compositus. gr. ii.—x.

Suppositoria Plumbi Comp.

Tinctura Opii. ℥v.—xv.

Tinctura Camphoræ Composita. ℥xxx.—ʒi.

Tinctura Opii Ammoniata. ℥xxx.—ʒi.

Unguentum Galle cum Opio.

Codeina. gr. $\frac{1}{4}$ —ii.

Phosphas. gr. $\frac{1}{4}$ —ii.

Syrupus. ℥xxx.—ʒii.

Morphinæ Hydrochloridum. gr. $\frac{1}{8}$ — $\frac{1}{2}$.

Liquor. ℥x.—ʒi.

Tinct. Morph. et Chlorof. Comp. ℥v.—xv.

Suppositoria.

Trochisci. i—3.

Trochisci Morphinæ et Ipecacuanhæ. i—3.

Morphinæ Acetas. gr. $\frac{1}{8}$ — $\frac{1}{2}$.

Liquor. ℥x.—ʒi.

Morphinæ Tartras. gr. $\frac{1}{8}$ — $\frac{1}{2}$. *Liquor.* ℥x.—ʒi.

Injectio Morphinæ Hypodermica. ℥ii.—v.

Papaveris Capsulæ.

Potassii Bromidum. gr. v.—xxx.

Sodii Bromidum. gr. v.—xxx.

Sulphonal. gr. x.—xxx. Paraldehydum. ʒss.—ii.

ANODYNES AND ANTISPASMODICS

Aconiti Radix.

*Linimentum.**Tinctura.* ℥v.—xv.*Aconitina.**Unguentum.*

Acetanilidum. gr. i.—iii.

Belladonnæ Folia.

Extractum Viride. gr. $\frac{1}{4}$ —i.*Succus.* ℥v.—xv.

Belladonnæ Radix.

Extractum Alcoholic. gr. $\frac{1}{4}$ —i.*Extractum Liquidum.**Tinctura.* ℥v.—xv.*Unguentum.**Emplastrum.**Linimentum.**Suppositoria.**Atropina.* gr. $\frac{1}{100}$ — $\frac{1}{10}$.*Unguentum.**Sulphas.* gr. $\frac{1}{100}$ — $\frac{1}{10}$.*Liquor Sulphatis.* ℥ $\frac{1}{2}$ —i.

Coca.

Extractum Liquid. ℥xxx.— \mathfrak{z} i.*Cocaina.**Unguentum.**Cocainæ Hydrochloridum.* gr. $\frac{1}{8}$ — $\frac{1}{2}$ *Injectio Hypodermica.* ℥iii.—v.

Conii Folia.

Succus. \mathfrak{z} i.—ii.*Unguentum.*

Conii Fructus.

Tinctura. ℥xxx.— \mathfrak{z} i.

Hyoscyami Folia.

Extractum Viride. gr. ii.—viii.*Succus.* ℥xxx.— \mathfrak{z} i.*Tinctura.* ℥xxx.— \mathfrak{z} i.*Hyoscyaminæ Sulphas.* gr. $\frac{1}{100}$ — $\frac{1}{10}$.*Hyoscine Hydrobromidum.* gr. $\frac{1}{100}$ — $\frac{1}{10}$.Menthol. gr. $\frac{1}{2}$ —ii.*Emplastrum.*

Phenazonum. gr. v.—xx.

Phenacetinum. gr. v.—x.

The figure of Indian
water, and hence it must
liquids by means of mucil-
lages of alkaline fluid, as
will also keep it in solution

2. Prescribe L. pulin.

L. pulin, gr. vii.
Extracti Gentianæ, q. s. ut
f. dose datur hora somni s.

Lupulin is best adminis-

3. Order Morphine Hy-
dromuri, equivalent to one grain of pow-

Morphine Hydrochloridi
Solutio. Levis, gr. x. i.
Extracti Gentianæ, q. s. ut
f. dose datur hora somni s.

The following may be
equivalents: 1 gr. Morphi-
ni = 3 gr. Ext. Opii = 1

Stramonii Folia.
Tinctura. ℥v.—xv.
 Stramonii Semina.
Extractum. gr. $\frac{1}{4}$ —i.
 Thymol. gr. $\frac{1}{2}$ —ii.

1. Prescribe a draught containing Indian Hemp.

℞
 Tincturæ Cannabis Indicæ, ℥xv.
 Mucilaginis Acaciæ, ℥ii.
 Aquæ Camphoræ, ad ℥iss.
 Misce. Fiat haustus, tertiis horis repetendus donec dolor
 mitescat.

The tincture of Indian hemp is decomposed by water, and hence it must be suspended in aqueous liquids by means of mucilage; the addition of a few drops of alkaline liquid, as aromatic spirit of ammonia, will also keep it in solution.

2. Prescribe Lupulin.

℞
 Lupulini, gr. viii.
 Extracti Gentianæ, quantum sufficit ut fiat massa. Fiant
 pilulæ duæ horâ somni sumendæ.

Lupulin is best administered in the form of pill.

3. Order Morphine Hydrochloride in doses equivalent to one grain of powdered opium.

℞
 Morphinæ Hydrochloridi, gr. i.
 Sacchari Lactis, gr. xvi.
 Extracti Glycyrrhizæ quantum sufficit ut fiat massa, in
 pilulas decem dividenda. Capiat unam omni nocte.

The following may be reckoned as therapeutical equivalents: 1 gr. Morph. Hydroch. = 10 gr. Pulv. Opii = 5 gr. Ext. Opii = 150 min. Tinct. Opii.

4. Prescribe Opium and Belladonna in combination.

R

Pulveris Opii, gr. iv.

Extracti Belladonnæ Alcoholici, gr. i.

Extracti Hyoscyami Viridis, gr. xvi.

Misce. Fiat massa, divide in pilulas quatuor. Capiat unam quartâ quâque horâ.

The above formula will be found useful in cases where it is necessary to relieve severe pain. Belladonna increases the hypnotic effects of opium and prevents the constipation produced by that drug. I may here quote the admirable paper by Professor Bartholow of Cincinnati on the combined administration of morphine, atropine, and chloral.¹ He says: "In man the excitant action of atropine hinders the occurrence of chloral narcosis, but rather deepens the sopor when it at last supervenes. The effects of atropine last much longer, and are apparently in no way prevented by chloral. Morphine deepens in every way the effects of chloral. Many of the unpleasant effects of morphine are modified as regards the wakefulness caused by the latter, but are not modified as regards the subsequent nausea, vomiting, headache, vertigo, and constipation. When the two agents are administered conjointly a much less quantity of chloral is necessary in order to produce sleep. These agents act much more favourably when administered simultaneously. Chloral causes sleep; morphine relieves pain; atropine prevents or lessens the depression in the respiration and cardiac movements caused by the other two, while it contributes to their cerebral effects.

¹ *New York Medical Journal*, January 1875.

"These physiological studies are confirmed by therapeutical results. The combination of chloral, morphine, and atropine is adapted to those cases of insomnia caused by pain, or in which chloral or morphine alone merely increases the cerebral excitement, as in hypochondria, puerperal mania, etc. This combination is also indicated in cases of fatty and irritable heart. When pain is to be relieved, chloral is not so serviceable as the combination with morphine and atropine."

5. Prescribe pills of Belladonna, Camphor, and Henbane.

R Extracti Belladonnæ Alcoholici, gr. iii.
Camphoræ, gr. xii.
Extracti Hyoscyami Viridis, gr. xv.
Misce. Fiat pilulæ sex, quarum sumat unam horâ decubitûs.

The administration of belladonna should be discontinued when the patient begins to complain of thirst.

6. Order a draught to contain Tincture of Henbane and Potassium Carbonate.

R Tincturæ Hyoscyami, ℥xxx.
Potassii Carbonatis, gr. x.
Syrupi Hemidesmi, ℥ii.
Aque Camphoræ, ad ℥iss.
Misce. Fiat haustus, horâ somni sumendus.

Solutions of caustic fixed alkalies are incompatible with belladonna, henbane, and stramonium, but carbonates and bicarbonates of the alkalies may be combined with these drugs.

7. Prescribe a sleeping draught for a case in which opium disagrees.

PRESCRIPTIONS
Opium and Belladonna in combina-
gr. xv.
Alcoholici, gr. i.
Viridis, gr. xvi.
Divide in pilulas quatuor. Capiat unam
Formula will be found useful in cases
necessary to relieve severe pain. Bella-
the hypnotic effects of opium and
constipation produced by that drug.
note the admirable paper by Professor
vincinnati on the combined administra-
e, atropine, and chloral.¹ He says:
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re favourably when administered simul-
chloral causes sleep; morphine relieves
prevents or lessens the depression in
and cardiac movements caused by the
e it contributes to their cerebral effects.
York Medical Journal, January 1875.

R̄

Tincturæ Hyoscyami, ℥xl.
 Potassii Bromidi, gr. x.
 Syrupi Rhoeados, ℥ii.
 Aquæ Camphoræ, ad ℥ii.

Misce, fiatque haustus, somno deficiente bibendus.

8. Prescribe pills containing Opium, so that the patient may not know he has been ordered that drug.

R̄

Pilulæ Saponis Compositæ, gr. iv.
 Vespere ante somnum sumenda.

9. Order a narcotic mixture for an infant.

R̄

Tincturæ Opii, ℥ii.
 Misturæ Amygdalæ, ℥i.
 Misce. Fiat mistura. Capiat cochleare parvum bis terve in die.

As we have already stated, children are peculiarly susceptible to the action of narcotics; belladonna is, however, much better borne by them than opium.

REFRIGERANTS

Agents which possess the property of reducing the sensation of abnormal heat of the body, and which are accordingly useful in allaying febrile disturbance. They are to be distinguished from true antipyretics.

Acidum Aceticum Dilutum. ℥i.—℥i.
 Acidum Citricum. gr. v.—xx.
 Acidum Phosphoricum Dilutum. ℥v.—xx.
 Acidum Tartaricum. gr. v.—xx.
 Ammonii Acetatis Liquor. ℥ii.—vi.
 Ammonii Citratis Liquor. ℥ii.—vi.
 Potassii Chloras. gr. v.—xv.
 Potassii Nitras. gr. v.—xx.
 Potassii Tartras Acidus. gr. xx.—℥i.

Juices of acidulous fruits are also refrigerant, and are useful in allaying thirst.

One or two examples of refrigerant mixtures will suffice. We will hereafter consider formulæ for external refrigerant applications.

1. R.

Liquoris Ammonii Citratis, ℥iiss.
Acidi Citrici, ℥i.
Syrupi Limonis, ℥ss.
Aquæ, ℥iv.

Misce. Fiat mistura, de quâ sumantur cochlearia duo magna subinde.

2. R.

Potassii Nitratis, ℥i.
Acidi Nitrici Diluti, ℥ii.
Spiritus Ætheris Nitrosi, ℥iv.
Syrupi Rhœados, ℥v.
Aquæ, ℥viss.

Misce. Fiat mistura. Capiat cochlearia duo magna ter quaterve in die.

SEDATIVES

Sedatives are defined as medicines which primarily depress the vital powers, and whose action is unaccompanied by a stage of excitement.

They may be divided into the following groups—

- I. Pulmonary Sedatives.
- II. Spinal Sedatives.
- III. Stomachic Sedatives.
- IV. Vascular Sedatives.

I. PULMONARY SEDATIVES

Substances which, however they may differ in their action in other respects, produce a direct sedative

REFRIGERANTS

which possess the property of reducing the abnormal heat of the body, and which are useful in allaying febrile disturbance. They are distinguished from true antipyretics.

Acidum Dilutum. ℥i-℥i.
Citricum. gr. v.-xx.
Phosphoricum Dilutum. ℥v.-xx.
Tartaricum. gr. v.-xx.
Acidum Liqueur. ℥ii.-vi.
Citricum Liqueur. ℥ii.-vi.
Chloric. gr. v.-xv.
Nitric. gr. v.-xx.
Tartaric Acidus. gr. xx.-℥i.

effect on the respiratory organs. The following may be enumerated—

Acidum Hydrocyanicum Dilutum. ℥ii.—vi.

Belladonna

Conium

Opium

} *Vide* "Narcotics."

Plumbi Acetas. *Vide* "Astringents."

Stramonium. *Vide* "Narcotics."

1. Write a formula for a mixture to contain Prussic Acid.

R

Acidi Hydrocyanici Diluti (B. P.), ℥xii.

Misturæ Amygdalæ, ℥vi.

Misce. Fiat mistura. Phialâ prius concussâ, capiat cochlearia duo magna tussi admodum ingravescente.

Prussic acid should generally be prescribed in the form of draught, as when given in mixture with thin liquids it is apt to float on the top, and a poisonous dose may thus be taken. By adapting almond mixture as the vehicle, and giving the direction to shake the bottle, this danger may be avoided.

The letters (B. P.) after the acid in the prescription are to signify that the pharmacopœial acid, the strength of which is 2 per cent, is intended, and not Scheele's acid, which contains 4 per cent.

2. Write a prescription for a mixture to contain chiefly Stramonium and Ipecacuanha.

R

Vini Ipecacuanhæ, ℥ss.

Tincturæ Stramonii, ℥i.

Syrupi Rhœados, ℥i.

Decocti Hordei (℥ii. ad Oi.), ℥v.

Misce. Fiat mistura. Capiat cochlearia duo magna tussi urgente.

Pulmonary sedatives may often be combined advantageously with depressing expectorants.

II. SPINAL SEDATIVES

Substances which depress the function of the spinal cord.

They are indicated in irritated conditions of the spinal cord, in spasmodic affections, and in over-excitement of the organs of generation. They are—

Ammonii Bromidum. gr. v.—xxx.

Conii Folia.

Succus. ʒi.—ii.

Unguentum.

Conii Fructus.

Tinctura. ℥xxx.—ʒi.

Physostigmatis Semina.

Extractum. gr. ¼—i.

Physostigminæ Sulphas. gr. ʒʒ—2ʒ.

Potassii Bromidum. gr. v.—xxx.

Sodii Bromidum. gr. v.—xxx.

Acidum hydrocyanicum acts on the whole nervous system, not specially on the spinal cord.

1. Prescribe pills of Calabar Bean and Hemlock.

R

Extracti Physostigmatis, gr. iv.

Pulveris Conii Fructus, gr. viii.

Syrupi Glucosi, quantum sufficiat ut fiat massa.

Misce. Fiant pilulæ sexdecim. Sumat unam sextis horis.

In making up the foregoing prescription, great care should be taken that the ingredients be thoroughly and equably incorporated; this, however, is more a matter for the dispenser than for the prescriber.

2. Write the formula for a draught to contain Ammonium Bromide, Sal Volatile, and Valerian.

R

Ammonii Bromidi, gr. x.
Spiritus Ammoniae Aromatici, ℥xxx.
Tincturae Valerianae Ammoniatae, ℥xxx.
Aqua Camphorae, ℥iiss.

Misce. Fiat haustus, bis terve die sumendus.

The ammoniated tincture of valerian is, of course, the preparation best suited for combination with the other ingredients in this prescription.

3. Prescribe Potassium Bromide with Hemlock and Henbane.

R

Potassii Bromidi, ℥i.
Succi Conii,
Succi Hyoscyami, aa ℥ii.
Aqua Camphorae, ℥vi.

Misce. Fiat mistura, cujus sumat aeger cochlearia duo magna quartâ quâque horâ.

During the exhibition of hemlock the occurrence of physiological effects, *e.g.* giddiness and languor, should be carefully watched for.

The combination of hemlock with belladonna, stramonium, henbane, or opium, intensifies the action of these drugs.

III. STOMACHIC SEDATIVES

Medicines which allay irritation of the stomach.

Some, as prussic acid, alkaline preparations, salts of bismuth and silver, etc., act by exerting a direct sedative effect on the mucous membrane; others, as belladonna, stramonium, hyoscyamus, and opium, act through the central nervous system.

Stomachic sedatives are indicated in painful affections of the stomach and upper portions of the canal, in pyrosis and vomiting.

They are—

- Acidum Carbolicum. *Vide* "Astringents."
Glycerinum. ℥v.—xv.
 Acidum Hydrocyanicum Dilutum. *Vide* "Pulmonary Sedatives."
 Argenti Nitras. gr. $\frac{1}{4}$ — $\frac{1}{2}$.
 Argenti Oxidum. gr. $\frac{1}{2}$ —ii.
 Belladonna. *Vide* "Narcotics."
 Bismuthi et Ammonii Citratis Liquor. ℥xxx.— $\overline{5}$ i.
 Bismuthi Carbonas. gr. v.—xx.
Trochisci Comp. i—6.
 Bismuthi Oxidum. gr. v.—xx.
 Bismuthi Subnitrates. gr. v.—xx.
 Cerii Oxalas. gr. ii.—x.
 Cocainæ Hydrochloridum. gr. $\frac{1}{5}$ — $\frac{1}{2}$.
 Creosotum. *Vide* "Astringents."
 Hyoscyamus } *Vide* "Narcotics."
 Opium }
 Potassii Bicarbonas } *Vide* "Antacids."
 Potassæ Liquor }
 Sodii Bicarbonas }
 Stramonium. *Vide* "Narcotics."

1. Prescribe Cerium Oxalate for vomiting of pregnancy.

R

Cerii Oxalatis, $\overline{5}$ i.
 Extracti Hyoscyami Viridis, gr. xxxvi.
 Misce. Fiant pilulæ duodecim, quarum capiat ægra unam bis in die.

Cerium Oxalate may also be given in the form of powder with sugar of milk, etc.

2. Prescribe Bismuth in solution with a bitter infusion.

℞

Liquoris Bismuthi et Ammonii Citratis, ℥iv.

Syrupi Aurantii, ℥iv.

Infusi Calumbæ, ℥v.

Misce. Fiat mistura. Sumantur cochlearia duo magna ter in die.

The liquor bismuthi et ammonii citratis is the only official soluble preparation of bismuth which we possess; it may not be prescribed with alkalies or their carbonates.

2. Prescribe Bismuth Carbonate.

℞

Bismuthi Carbonatis, gr. xv.

Sit pulvis, in cyatho lactis sumendus.

Milk is an excellent medium for the administration of bismuth carbonate. This salt and the subnitrate may also be given suspended by mucilage in aqueous vehicles.

IV. VASCULAR SEDATIVES

Medicines which depress the action of the heart and vascular system. Some act chiefly on the heart, others act more especially on the smaller vessels and capillaries; they may therefore be divided into *Cardiac* and *Capillary* Sedatives. The former are indicated in cases in which it is desirable to moderate excessive action of the heart, the latter are useful in inflammations, hæmorrhages, etc.

CARDIAC SEDATIVES

Acidum Hydrocyanicum Dilutum. ℥ii.—vi.

Aconiti Radix.

Tinctura. ℥v.—xv.

Linimentum.

Prescribe a mixture
℞
Tinctura Aconiti (B. P.)
Aqua Mentha Piperita
Misce. Fiat mistura. Sumantur cochlearia duo magna ter in die.

- Colchici Cormus. gr. ii.—v.
Extractum. gr. $\frac{1}{4}$ —i.
Vinum. ℥x.—xxx.
 Colchici Semina.
Tinctura. ℥v.—xv.
 Digitalis. gr. $\frac{1}{2}$ —ii.
Infusum. ℥ii.—iv.
Tinctura. ℥v.—xv.
 Physostigmatis Semina.
Extractum. gr. $\frac{1}{4}$ —i.
Physostigminæ Sulphas. gr. $\frac{1}{60}$ — $\frac{1}{20}$.

CAPILLARY SEDATIVES

- Amyl Nitris. ℥ii.—v. *cautiously inhaled.*
 Antimonii Oxidum. gr. i.—ii.
Pulvis Antimonialis. gr. iii.—vi.
 Antimonium Tartaratum. gr. $\frac{1}{4}$ — $\frac{1}{8}$.
Unguentum.
 Ethyl Nitritis Liquor. ℥xx.—℥i.
 Ergota. gr. x.—xxx.
Extractum Ergotæ. gr. i.—iv.
Infusum. ℥ss.—i.
Tinctura Ammoniata. ℥x.—xxx.
 Ipecacuanha. gr. i.—ii.
Pilula Ipecacuanhæ cum Scillâ. gr. iv.—viii.
Pulvis Ipecacuanhæ Compositus. gr. v.—xv.
Trochisci. 1—3.
Vinum. ℥x.—xxx. *Acetum.* ℥x.—xxx.
 Nitroglycerinum (Trinitrin).
Tabellæ. i.—ii. *Liquor.* ℥ $\frac{1}{2}$ —ii.
 Plumbi Acetas. gr. i.—v.
Pilula Plumbi cum Opio. gr. iv.—viii.
Suppositoria Plumbi Composita.
Unguentum.
 Potassii Nitras. gr. v.—xx.
 Sodii Nitris. gr. i.—ii.

1. Prescribe a mixture of Aconite.

- ℞
 Tincturæ Aconiti (B. P.), ℥iss.
 Aquæ Menthæ Piperitæ, ℥iv.
 Misce. Fiat mistura. Capiat cochleare magnum sextis horis
 donec dolor mitescat.

1. Prescribe a draught
perated with Infusion of C
B
Etheris, ʒi.
Cucul. gr. ii.
Terebinth. et gra. ss. ad ʒi.
Infus. Caryoph. ad ʒi.
Mise. Fiat haustus, sicuti
Elder may be easily incor-
vehicle by rubbing it up w
proportions.

1

of the vascular system is required. The following are the chief Exhilarants—

- Alcohol, in various forms, as—
Spiritus Vini Gallici.
Mistura Spiritus Vini Gallici. ℥i.—ii.
Vinum Xericum.
 Æther. ℥xx.—℥i.
Spiritus. ℥xxx.—℥iss.
Spiritus Compositus. ℥xxx.—℥iss.
 Æther Aceticus. ℥xx.—℥i.
 Cannabis Indica.
Extractum. gr. ¼—i.
Tinctura. ℥v.—xv.
 Chloroformum. ℥i.—v.
Aqua. ℥ss.—i.
Linimentum.
Spiritus. ℥xx.—xl.
 Opium. *In small doses.*

1. Prescribe a draught to contain Ether incorporated with Infusion of Cloves.

℞
 Ætheris, ℥i.
 Cetacei, gr. ii.
 Tere simul et gradatim adde
 Infusi Caryophylli, ad ℥i.
 Misce. Fiat haustus, statim sumendus.

Ether may be easily incorporated with an aqueous vehicle by rubbing it up with spermaceti in the above proportions.

2. Prescribe a draught to consist of Hoffmann's Anodyne, Chloric Ether, and Peppermint Water.

℞
 Spiritus Ætheris Compositi, ℥xl.
 Spiritus Chloroformi, ℥xx.
 Aquæ Menthæ Piperitæ, ℥i.
 Misce. Fiat haustus, statim sumendus, et repetatur quartâ parte horæ.

3. Write a formula for a mixture to contain Indian Hemp.

R

Tincturæ Cannabis Indicæ, ʒi.
Mucilaginis Acaciæ, ʒi.
Syrupi Zingiberis, ʒss.
Aque Menthæ Piperitæ, ad ʒvi.
Misce. Fiat mistura. Capiat cochlearia duo ampla quartâ quâque horâ.

The tincture of cannabis indica is one of those which require to be suspended by mucilage.

II. SPINAL STIMULANTS

Substances which stimulate the functions of the spinal cord. They are indicated in some cases of paraplegia unaccompanied by inflammation, in chronic hemiplegia, in local paralysis, and in functional debility of the cord.

They are—

Arnicae Rhizoma.

Tinctura. ℥xxx.—ʒi.

Belladonna. Vide "Narcotics."

Cannabis Indica.

Extractum. gr. ʒ—i.

Tinctura. gr. v.—xv.

Cantharides. Vide "Diuretics."

Ergota. Vide "Emmenagogues."

Nux Vomica. gr. i.—iv.

Extractum. gr. ʒ—i.

Tinctura. ℥x.—xv.

Strychnina. gr. ʒʒ—1ʒ.

Strychninae Hydrochloridum. gr. ʒʒ—1ʒ.

Liquor Hydrochloridi. ℥ii.—viii.

Picrotoxinum. gr. 1ʒʒ—2ʒ.

Phosphorus. gr. 1ʒʒ—2ʒ.

Oleum Phosphoratum. ℥i.—v.

Pilula Phosphori. gr. i.—ii.

1. Write a formula for a mixture to contain chiefly Arnica and Belladonna.

R
Tincturæ Arnicæ, ℥ii.
Tincturæ Belladonnæ, ℥xxx.
Spiritus Chloroformi, ℥lxxx.
Aquæ Camphoræ, ad ℥iv.
Misce. Fiat mistura, de quâ sumantur cochlearia duo magna tertiis horis.

2. Prescribe pills of Nux Vomica and Ergot.

R
Extracti Nucis Vomicae, gr. vi.
Pulveris Ergotæ, gr. xxiv.
Extracti Glycyrrhizæ, quantum sufficit ut fiat massa, in pilulas sex dividenda, e quibus capiat tres in dies.

3. Prescribe Phosphorus in a liquid form.

R
Phosphori, gr. i.
Olei Morrhuæ, ℥iv.
Solve bene. Capiat cochleare minimum bis in die.

When phosphorus is combined with vegetable oils it is liable to be converted into hypophosphorous acid, hence cod-liver oil is a more suitable medium for its administration. Phosphorus is soluble in ether and in carbon bisulphide, but the solution is liable to variation in strength owing to the evaporation of the solvent; phosphorus when given thus is liable to form a coating on the tongue. The Phosphorus Pill of the Pharmacopœia is an eligible form for the administration of the drug.

III. STOMACHIC STIMULANTS

Medicines which act as stimulants to the mucous membrane of the stomach and intestines. They are

K

indicated in cases of pain, spasm, and flatulent distension, and are very generally employed to correct the griping properties of purgatives.

They may frequently be combined advantageously with stomachic tonics.

They are—

Æther. ℥xx.—℥i.

Spiritus Ætheris. ℥xx.—℥iss.

Spiritus Ætheris Comp. ℥xx.—℥iss.

Æther Aceticus. ℥xx.—℥iss.

Anethi Fructus.

Aqua. ℥ss.—i.

Anethi Oleum. ℥½—iii.

Anisi Oleum. ℥½—iii.

Aqua. ℥ss.—i.

Spiritus. ℥v.—xx.

Amoraciac Radix.

Spiritus Armoraciac Compositus. ℥i.—ii.

Cajuputi Oleum. ℥½—iii.

Spiritus. ℥v.—xx.

Capsici Fructus.

Tinctura. ℥v.—xv.

Cardamomi Semina.

Tinctura Cardamomi Composita. ℥xxx.—℥i.

Carui Fructus.

Aqua. ℥ss.—i.

Carui Oleum. ℥½—iii.

Caryophyllum.

Infusum. ℥ss.—i.

Caryophylli Oleum. ℥½—iii.

Cinnamomi Cortex.

Aqua. ℥ss.—i.

Pulvis Cinnamomi Compositus. gr. x.—xl.

Tinctura. ℥xxx.—℥i.

Cinnamomi Oleum. ℥½—iii.

Coriandri Fructus.

Coriandri Oleum. ℥½—iii.

Fœniculi Fructus.

Aqua. ℥ss.—i.

Menthæ Piperitæ Oleum. ℥½—iii.

Aqua. ℥ss.—i.

Spiritus. ℥v.—xx.

Menthæ Viridis Oleum. $\mathfrak{m}\frac{1}{2}$ —iii.

Aqua. \mathfrak{z} ss.—i.

Myristica.

Myristicæ Oleum. $\mathfrak{m}\frac{1}{2}$ —iii.

Spiritus. $\mathfrak{m}\mathfrak{l}\mathfrak{v}$.—xx.

Pimenta.

Aqua. \mathfrak{z} ss.—i.

Pimentæ Oleum. $\mathfrak{m}\frac{1}{2}$ —iii.

Piper Nigrum.

Confectio. \mathfrak{z} i.—ii.

Sinapis.

Sinapis Oleum. $\mathfrak{m}\frac{1}{2}$ —iii.

Zingiber.

Tinctura. $\mathfrak{m}\mathfrak{xxx}$.— \mathfrak{z} i.

Syrupus. $\mathfrak{m}\mathfrak{xxx}$.— \mathfrak{z} i.

1. Prescribe a mixture of Calumba and Cloves.

R

Tincturæ Calumbæ, \mathfrak{z} i.

Syrupi Zingiberis, \mathfrak{z} iv.

Iniusi Caryophylli, \mathfrak{z} viss.

Misce. Fiat mistura, de quâ sumantur cochlearia duo magna horâ post jentaculum totidemque horis duabus ante prandendum.

IV. VASCULAR STIMULANTS

Medicines which stimulate the action of the heart and vascular system.

Some act chiefly on the heart, others more especially on the smaller vessels and capillaries; they may be accordingly divided into *Cardiac* and *Capillary* Stimulants. The former are indicated in cases in which it is required to excite the action of the heart, the latter are indicated in chronic inflammations when the circulation through the diseased part is languid.

CARDIAC STIMULANTS

Æther. $\mathfrak{m}\mathfrak{xx}$.— \mathfrak{z} i.

Spiritus. $\mathfrak{m}\mathfrak{xxx}$.— \mathfrak{z} iss.

Spiritus Compositus. $\mathfrak{m}\mathfrak{xxx}$.— \mathfrak{z} iss.

- Alcohol in various forms.
 Ammonia.
 Ammonii Carbonas. gr. iii.—x.
 Spiritus Ammoniae Aromaticus. ℥ xxx.—℥i.
 Caffeina. gr. i.—v.
 Citras. gr. ii.—x.
 Citras Effervescens. ℥i.—ii.
 Camphora. gr. ii.—v.
 Aqua. ℥ss.—i.
 Linimentum.
 Linimentum Camphoræ Ammoniatum.
 Spiritus. ℥ v.—xx.
 Tinctura Camphoræ Composita. ℥ xxx.—℥i.
 Chloroformum. ℥i.—v.
 Aqua. ℥ss.—i.
 Linimentum.
 Spiritus. ℥ v.—xx.
 Strophanthi Semina.
 Extractum. gr. ¼—i.
 Tinctura. ℥ v.—xv.
 Sumbul Radix.
 Tinctura. ℥ xxx.—℥i.
 Valerianæ Rhizoma.
 Tinctura Valerianæ Ammoniata. ℥ xxx.—℥i.

CAPILLARY STIMULANTS

- Ammonii Acetatis Liquor. ℥ii.—vi.
 Ammonii Citratis Liquor. ℥ii.—vi.
 Mezerei Cortex.
 Sassafras Radix.
 Serpentariæ Rhizoma.
 Infusum. ℥ss.—i.
 Tinctura. ℥ xxx.—℥i.
 Liquor Concentratus. ℥ xxx.—℥ii.

We have already frequently studied examples of the mode of prescribing the foregoing medicines.

SPECIAL STIMULANTS, ALTERATIVES,
OR SPECIFICS

Medicines which exert a special action on the general system, or on certain organs, and which give rise to some alteration in vital action (*Alteratives*), or exert a special influence in certain diseases (*Specifics*).

They may be enumerated as follows :—

Antimonial Preparations—

- Antimonii Oxidum. gr. i.—ii.
- Pulvis Antimonialis.* gr. iii.—vi.
- Antimonium Sulphuratum. gr. i.—ii.
- Antimonium Tartaratum. gr. $\frac{1}{8}$ — $\frac{1}{2}$.
- Vinum Antimoniale.* ℥v.—x.

Arsenical Preparations—

- Acidum Arseniosum. gr. $\frac{1}{60}$ — $\frac{1}{15}$.
- Liquor Arsenicalis.* ℥ii.—viii.
- Liquor Arsenici Hydrochloricus.* ℥ii.—viii.
- Arsenii Iodidum. gr. $\frac{1}{20}$ — $\frac{1}{6}$.
- Ferri Arsenas. gr. $\frac{1}{6}$ — $\frac{1}{4}$.
- Sodii Arsenas. gr. $\frac{1}{60}$ — $\frac{1}{10}$.
- Liquor.* ℥ii.—viii.

Bromine Preparations—

- Acidum Hydrobromicum Dilutum. ℥xv.— $\overline{3}$ i.
- Ammonii Bromidum. gr. v.—xxx.
- Potassii Bromidum. gr. v.—xxx.
- Sodii Bromidum. gr. v.—xxx.

Chlorine Preparations—

- Ammonii Chloridum. gr. v.—xx.
- Calcii Chloridum. gr. v.—xx.
- Soda Chlorinata.
- Liquor.* ℥x.—xx.
- Sodii Chloridum.
- Potassii Chloridum.
- Colchici Cormus. gr. ii.—v.
- Extractum.* gr. $\frac{1}{4}$ —i.
- Vinum.* ℥x.—xxx.
- Colchici Semina.
- Tinctura.* ℥v.—xv.
- Copaiba. ℥xxx.— $\overline{3}$ i.

Copaibæ Oleum. ℥v.—xx.

Cubeba.

Tinctura. ℥xxx.—℥i.

Cubebæ Oleum. ℥v.—xx.

Hemidesmi Radix.

Syrupus. ℥xxx.—℥i.

Mercurial Preparations—

Hydrargyrum.

Hydrargyrum cum Cretâ. gr. i.—v.

Pilula Hydrargyri. gr. iv.—viii.

Emplastrum.

Emplastrum Ammoniaci cum Hydrargyro.

Linimentum.

Unguentum.

Unguentum Hydrargyri Compositus.

Hydrargyri Iodidum Rubrum. gr. $\frac{1}{2}$ — $\frac{1}{10}$.

Unguentum.

Liquor Arsenii et Hydrargyri Iodidi. ℥v.—xx.

Hydrargyri Perchloridum. gr. $\frac{1}{2}$ — $\frac{1}{10}$.

Liquor. ℥xxx.—℥i.

Lotio Flava.

Hydrargyri Subchloridum. gr. $\frac{1}{2}$ —v.

Lotio Nigra.

Pilula Hydrargyri Subchloridi Composita. gr.

iv.—viii.

Unguentum.

Hydrargyri Nitratis Liquor Acidus.

Unguentum Nitratis.

Unguentum Nitratis Dilutus.

Hydrargyri Oleas.

Unguentum.

Hydrargyri Oxidum Rubrum.

Unguentum.

Hydrargyri Oxidum Flavum.

Unguentum.

Hydrargyrum Ammoniatum.

Unguentum.

Guaiaci Lignum.

Guaiaci Resina. gr. v.—xv.

Mistura. ℥iv.—℥i.

Tinctura Guaiaci Ammoniata. ℥xxx.—℥i.

Trochisci. 1—6.

Iodine Preparations—

Iodum.

- Tinctura.* ℥ii.—v.
Liquor Fortis.
Unguentum.
 Iodoformum. gr. $\frac{1}{2}$ —iii.
Suppositoria.
Unguentum.
 Ferri Iodidum.
Syrupus. ℥xxx.— $\overline{5}$ i.
 Plumbi Iodidum.
Emplastrum.
Unguentum.
 Potassii Iodidum. gr. v.—xx.
Linimentum Potassii Iodidi cum Sapone.
Unguentum.
 Sodii Iodidum. gr. v.—xx.
 Sulphuris Iodidum.
Unguentum.
 Morrhuae Oleum.
Phosphorus Preparations—
 Phosphorus. gr. $\frac{1}{100}$ — $\frac{1}{20}$.
Oleum Phosphoratum. ℥i.—v.
Pilula Phosphori. gr. i.—ii.
 Calcii Hypophosphis. gr. iii.—x.
 Sodii Hypophosphis. gr. iii.—x.
 Calcii Lactophosphas.
Syrupus. ℥xxx.— $\overline{5}$ i.
 Sarsae Radix.
Liquor Concentratus. $\overline{5}$ ii.—viii.
Extractum Liquidum. $\overline{5}$ ii.—iv.
Sulphur Preparations—
 Sulphur Præcipitatum. gr. xx.— $\overline{5}$ i.
Trochisci. i—6.
 Sulphur Sublimatum. gr. xx.— $\overline{5}$ i.
Confectio. $\overline{5}$ i.—ii.
Unguentum.

. 1. Prescribe a mixture to contain Arsenic and Iron.

- ℞
 Liquoris Arsenici Hydrochlorici, ℥xxiv.
 Liquoris Ferri Perchloridi, $\overline{5}$ iii.
 Aquæ, ad $\overline{5}$ iii.
 Misce. Fiat mistura. Capiat cochleare medium ter in die post cibum.

The student might have suggested the use of the iron arsenate, but the proportion of iron in this salt is too insignificant to be of any therapeutical efficacy so far as the iron is concerned. It is always advisable to administer arsenical preparations in the liquid form, and they should be taken with or immediately after meals. Pain in the epigastrium, nausea, and irritation of the eyelids are indications for ceasing the administration of the arsenic or diminishing the dose.

2. Order Copaiba in mixture.

R

Copaibæ, ℥iv.
Liquoris Potassæ, ℥iv.
Tere bene simul, dein adde inter terendum
Syrupi Aurantii, ℥i.
Fiat mistura. Capiat cochleare medium ter in die ex cyatho
Aquæ Cinnamomi.

The above is an excellent form for the exhibition of copaiba. It is also frequently given with spirit of nitrous ether, or it may be made into emulsion by rubbing it first with mucilage, or yolk of egg and sugar, and then adding some aromatic water. One ounce and a quarter of mucilage should be used with each ounce of copaiba.

Copaiba is sometimes given in the form of pill, made by boiling the copaiba with calcined magnesia, when the required consistence will be obtained in twelve or fifteen hours, or with calcium hydroxide, in which case the proper consistence is obtained in four or five hours.

A favourite method of administering copaiba is in gelatin capsules.

3. Write a formula for a mixture of Potassium Iodide and Sarsaparilla.

R

Potassii Iodidi, gr. xl.
Syrupi Hemidesmi, ℥i.
Extracti Sarsæ Liquidi, ℥ii.
Aquæ, ℥v.

Misce. Fiat mistura. Sumat cochlearia duo magna ter in die.

4. Prescribe Potassium Iodide with a salt of Iron and Cod-liver oil.

R

Potassii Iodidi, gr. xl.
Syrupi Ferri Iodidi, ℥iv.
Olei Morrhuæ, ℥iiiss.

Misce. Fiat Mistura. Capiat cochleare amplum bis in die.

The syrup of ferrous iodide will be at once selected as the most eligible preparation for combination with the other ingredients in this prescription.

5. Prescribe powders consisting of a combination of Grey Powder and Dover's Powder for a child.

R

Hydrargyri cum Cretâ, gr. xii.
Pulveris Ipecacuanhæ Compositi, gr. iii.

Misce, et in pulveres sex divide, quorum capiat æger unum omnibus sextis horis.

6. Prescribe the Red Iodide of Mercury in mixture.

R

Hydrargyri Iodidi Rubri, gr. i.
Potassii Iodidi, gr. xl.
Syrupi Zingiberis, ℥iv.
Aquæ, ad ℥viii.

Misce. Fiat mistura. Capiat cochleare magnum sextâ quâque horâ.

The biniodide of mercury, which is insoluble in

water, is readily soluble in an aqueous solution of potassium iodide.

7. Write a formula for Cod-liver Oil in emulsion.

Rx

Olei Morrhuae,
Mucilaginis Tragacanthæ, ana ℥ii.
Aquæ Menthæ Piperitæ, ℥iv.

Tere bene simul ut fiat mistura, cujus capiat cochlearia duo ampla ter in die.

The foregoing formula, which may be prescribed for those who have a distaste for the oil, is taken from Neligan.

TONICS

Medicines which by imperceptible degrees permanently augment the vigour of the vital functions. They are divided into four groups—

- I. Blood Tonics.
- II. Nervine Tonics.
- III. Stomachic Tonics.
- IV. Vascular Tonics.

I. BLOOD TONICS

Substances which primarily alter the character and composition of the blood.

They are—

Ferri Acetas.

Liquor. ℥v.—xv.

Ferri Arsenas. gr. $\frac{1}{16}$ — $\frac{1}{4}$.

Ferri Carbonas Saccharatus. gr. x.—xxx.

Mistura Ferri Composita. ℥ss.—i.

Pilula Ferri Carbonatis. gr. v.—xv.

Ferri et Ammonii Citras. gr. v.—x.

Vinum Ferri Citratis. ℥i.—iv.

Ferri et Quininae Citras. gr. v.—x.
 Ferri Iodidum.
Syrupus. ℥xxx.—℥i.
 Ferri Perchloridi Liquor Fortis.
Liquor Ferri Perchloridi. ℥v.—xv.
Tinctura Ferri Perchloridi. ℥v.—xv.
 Ferri Pernitratiss Liquor. ℥v.—xv.
 Ferri Persulphatis Liquor.
 Ferri Phosphas. gr. v.—x.
Syrupus. ℥xxx.—℥i.
Syrupus Ferri Phosphatis cum Quinina et Strychnina. ℥xxx.—℥i.
 Ferri Sulphas. gr. i.—v.
 Ferri Sulphas Exsiccatus. gr. ½—iii.
 Ferrum.
Vinum Ferri. ℥i.—iv.
 Ferrum Redactum. gr. i.—v.
Trochisci. 1—6.
 Ferrum Tartaratum. gr. v.—x.
 Liquor Potassii Permanganatis. ℥ii.—iv.
 Morrhuae Oleum. ℥i.—℥i.

Blood tonics are indicated in cases of anæmia, wasting, and scorbutus or scurvy.

1. Prescribe a mixture of Iron, Bismuth, and Ammonia.

℞
 Liquoris Bismuthi et Ammonii Citratis, ℥iv.
 Vini Ferri Citratis, ℥ii.
 Syrupi Limonis, ℥i.
 Aquæ, ad ℥viii.
 Misce. Fiat mistura, cujus sumantur cochlearia duo magna ter in die.

2. Prescribe Reduced Iron for a child.

℞
 Ferri Redacti, gr. iii.
 Pulveris Tragacanthæ, gr. xxx.
 Misce, et divide in pulveres sex. Sumat unum bis in die.

Reduced iron is peculiarly adapted for children on account of its freedom from the inky taste which characterises other iron preparations. It is best given to children in the form of powder or lozenge, and for adults it may be made up into pills with balsam of Peru, which prevents oxidation of the iron.

3. Write the formula for a mixture to contain Iron in combination with an alkaline carbonate and a bitter vegetable infusion.

R

Ferri Tartarati, gr. lxxx.
Potassii Bicarbonatis, ℥ii.
Syrupi Hemidesmi, ℥i.
Infusi Calumbæ, ℥vii.

Misce. Fiat mistura. Capiat cochlearia duo magna bis in die.

Tartarated iron goes well with alkaline carbonates, and, as we have already seen, infusion of calumba or quassia is compatible with iron salts.

II. NERVINE TONICS

Medicines which give tone to the nervous system, and some of which act as Antiperiodics. Nervine Tonics are indicated in spasmodic and other affections of the nervous system, and in cases of nervous debility. Antiperiodics are given in intermittent fever and in intermittent forms of neuralgia.

NERVINE TONICS WHICH EXERT AN ANTIPERIODIC ACTION

Acidum Arseniosum. gr. $\frac{1}{60}$ — $\frac{1}{8}$.
Liquor Arsenicalis. ℥ii.—viii.
Liquor Arsenici Hydrochloricus. ℥ii.—viii.
Sodii Arsenas. gr. $\frac{1}{40}$ — $\frac{1}{8}$.
Liquor. ℥ii.—viii.

Cinchonæ Rubræ Cortex. gr. x.— ʒi .
Extractum Cinchonæ Liquidum. ʒv .—xv.
Infusum Acidum. ʒss .—i.
Tinctura. ʒxxx .— ʒi .
Tinctura Cinchonæ Composita. ʒxxx .— ʒi .
 Quininæ Hydrochloridum Acidum. gr. i.—x.
 Quininæ Hydrochloridum. gr. i.—x.
Tinctura. ʒxxx .— ʒi .
Vinum. ʒss .— ʒi .
 Quininæ Sulphas. gr. i.—x.
Pilula. gr. ii.—viii.
Tinctura Quininæ Ammoniata. ʒxxx .— ʒi .
 Eucalypti Gummi. gr. ii.—v.
 Salicinum. gr. v.—xx.

NERVINE TONICS WHICH DO NOT EXERT AN ANTIPERIODIC ACTION

Argenti Nitras. gr. $\frac{1}{4}$ — $\frac{1}{2}$.
 Argenti Oxidum. gr. $\frac{1}{2}$ —ii.
 Cupri Sulphas. gr. $\frac{1}{4}$ —ii.
 Cuspariæ Cortex.
Infusum. ʒi .—ii.
Liquor Concentratus. ʒxxx .— ʒi .
 Ferrum. All salts. *Vide* "Blood Tonics."
 Nux Vomica. gr. i.—iv.
Extractum. gr. $\frac{1}{4}$ —i.
Extractum Liquidum. ʒi .—iii.
Tinctura. ʒv .—xv.
 Strychnina. gr. $\frac{1}{60}$ — $\frac{1}{15}$.
 Strychninæ Hydrochloridum. gr. $\frac{1}{60}$ — $\frac{1}{15}$.
Liquor. ʒv .—x.
 Zinci Acetas. gr. i.—ii.
 Zinci Oxidum. gr. iii.—x.
 Zinci Sulphas. gr. i.—iii.

I. Write for a mixture of Arsenic and Cinchona.

℞
 Liquoris Arsenici Hydrochlorici, ʒxxx .
 Extracti Cinchonæ Liquidum, ʒss .
 Aquam, ad ʒviii .
 Misce. Fiat mistura, cujus sumantur cochlearia duo magna
 sextis horis post cibum.

A combination of arsenic with cinchona will often prove of service as an antiperiodic when either alone will fail.

2. Prescribe pills of Salicin and Quinine Sulphate.

R

Salicini, gr. xxiv.
Quininæ Sulphatis, gr. xxiv.
Extracti Gentianæ quantum sufficit ut fiat massa, divide
in pilulas duodecim. Capiat unam ter in die.

3. Write the formula for a mixture to contain Zinc and Phosphoric Acid.

R

Zinci Phosphatis, gr. xii.
Acidi Phosphorici Diluti, ℥xii.
Aquæ Destillatæ, ℥vi.
Misce. Fiat mistura. Capiat partem sextam ter in die.

The foregoing prescription is slightly modified from a formula by Tanner, and illustrates an excellent method of administering phosphate of zinc. This salt is not official, but is of great value in the treatment of certain nervous affections. It requires the presence of phosphoric acid for its solution.

4. Prescribe an acid mixture of Quinine and Strychnine.

R

Quininæ Hydrochloridi, gr. xxiv.
Liquoris Strychninæ Hydrochloridi, ℥xxiv.
Acidi Hydrochlorici diluti, ℥xxx.
Syrupi Aurantii, ℥i.
Aquæ, ℥v.
Misce. Fiat mistura, cujus sumat æger cochleare magnum
tertiâ quâque horâ.

We have chosen quinine hydrochloride as the most suitable to accompany the soluble salt of strychnine

Medicines which are
stimulating, improving the
nutrition. They are divided into
three modes of action. 1st. Stomachic
agents of the mucous membrane
in cases of simple debility
by chronic dyspepsia, ex-
haustion. Others act as tonic
and these are indicated
from nervous debility. 3d.
Injunctive principles, and
old age, etc. 4th. A fo-
cus of the lower bowel,
disturbance of the stomach it
atonic dyspepsia is asso-
ciated with the bowel and liver.
The following are the

and its acid. If quinine sulphate is prescribed in solution it is necessary to add a sufficient proportion of a dilute mineral acid. A drachm of quinine sulphate requires thirty minims of dilute sulphuric acid for its solution in two ounces of water, and it requires eighty minims of dilute nitric acid for its solution in three ounces of water. The *acid* hydrochloride is readily soluble in water.

Quinine should not be prescribed with astringent infusions, as a tannate of quinine is precipitated, a circumstance which the addition of sulphuric acid rather favours. We have already seen that when quinine is given in acid infusion of roses a turbid mixture results.

III. STOMACHIC TONICS

Medicines which act directly as tonics to the stomach, improving the appetite and aiding in digestion. They are divided into groups according to their mode of action. 1st. Some act by altering the vascularity of the mucous membrane, and these are indicated in cases of simple debility of that membrane caused by chronic dyspepsia, excessive use of alcohol, etc. 2nd. Others act as tonics through the nervous system, and these are indicated in atonic dyspepsia arising from nervous debility. 3rd. Some stomachics consist of digestive principles, and are useful in the dyspepsia of old age, etc. 4th. A fourth group act by altering the state of the lower bowel, and thus relieve morbid conditions of the stomach itself; these are indicated when atonic dyspepsia is associated with a torpid condition of the bowel and liver.

The following are the chief Stomachic Tonics—

FIRST GROUP

- Acidum Hydrochloricum Dilutum. ℥v.—xx.
 Acidum Nitricum Dilutum. ℥v.—xx.
 Acidum Nitro-hydrochloricum Dilutum. ℥v.—xx.
 Calumbæ Radix. gr. x.—xx.
 Liquor Concentratus. ℥xxx.—ʒi.
 Infusum. ʒss.—i.
 Tinctura. ℥xxx.—ʒi.
 Cascarille Cortex. gr. x.—xx.
 Infusum. ʒss.—i.
 Tinctura. ℥xxx.—ʒi.
 Chirata.
 Liquor Concentratus. ℥xxx.—ʒi.
 Infusum. ʒss.—i.
 Tinctura. ℥xxx.—ʒi.
 Cuspariæ Cortex. gr. x.—xx.
 Liquor Concentratus. ℥xxx.—ʒi.
 Infusum. ʒi.—ii.
 Gentianæ Radix. gr. x.—xx.
 Extractum. gr. ii.—viii.
 Infusum Gentianæ Compositum. ʒss.—i.
 Tinctura Gentianæ Composita. ℥xxx.—ʒi.
 Lupulus.
 Infusum. ʒi.—ii.
 Tinctura. ℥xxx.—ʒi.
 Lupulinum. gr. ii.—v.
 Quassia Lignum.
 Liquor Concentratus. ℥xxx.—ʒi.
 Infusum. ʒss.—i.
 Tinctura. ℥xxx.—ʒi.

SECOND GROUP

- Cinchona. }
 Nux Vomica. } *Vide "Nervine Tonics."*
 Iron Salts. }

THIRD GROUP

- Pepsinum. gr. v.—x.
 Glycerinum. ʒi.—ii.

FOURTH GROUP

- Aloes. }
 Rheum. } *Vide "Cathartics."*
 Euonymus. }

1. Prescribe in mixture one of the dilute mineral acids, Tincture of Hops, and a bitter infusion.

R

Acidi Nitro-hydrochlorici Diluti, ʒii.
Tincture Lupuli, ʒi.
Tincture Aurantii, ʒi.
Infusi Calumbæ, ʒvi.

Misce. Fiat mistura, de quâ cochlearia duo magna ter in die exhibeantur.

2. Prescribe pills of Pepsin.

R

Pepsini (B. P.), gr. xxxvi.
Glycerini quantum sufficit ut fiat massa, in pilulas duodecim dividenda, e quibus capiat unam ter in die ante cibum.

The letters (B. P.) in the above prescription are to signify that the Pharmacopœial preparation is to be used, and not Boudault's Pepsin, which is mixed with starch and requires to be given in much larger doses. Pepsin should always be given with, or shortly before, meals.

3. Prescribe Pepsin in mixture.

R

Pepsini (B. P.), ʒi.
Acidi Hydrochlorici Diluti, ʒii.
Syrupi Aurantii, ʒi.
Infusi Cascarillæ, ʒviii.

Misce. Fiat mistura. Cochleare magnum ter in die exhibeatur, quâque vice phialam agitando, ut permisceatur pulvis.

The efficacy of pepsin is much increased when it is given in conjunction with dilute hydrochloric acid. The official Glycerin of Pepsin is a convenient form for administration in acid mixtures.

IV. VASCULAR TONICS

Substances which give strength to the heart and vascular system. Among them may be enumerated preparations of iron, acid and astringent preparations, the foregoing groups of tonics, and lastly, digitalis, which, although described as a cardiac sedative in large doses, in small doses exerts a tonic effect on the walls of the heart. The same is true of strophanthus.

1. Prescribe in mixture Digitalis and Iron for a case of cardiac weakness with dilatation of the ventricles.

R

Tincturæ Ferri Perchloridi, ℥ii.
Syrupi Zingiberis, ℥vi.
Infusi Digitalis, ℥v.
Misce. Fiat mistura. Capiat cochleare magnum ter in die.

EXAMPLES OF PRESCRIPTIONS FOR EXTERNAL AND LOCAL APPLICATION.

We will conclude our series of lessons with a few examples of Prescriptions for External and Local Application.

1. Prescribe an anodyne poultice containing Belladonna.

R

Extracti Belladonnæ Viridis, ℥i.
Lini Contusi, ℥xii.
Aquæ bullientis, quantum sufficiat ut fiat cataplasma ad-
movendum calide loco adfecto.

2. Prescribe an astringent eye-wash of Alum.

℞
Aluminis, gr. x.
Aquæ Rosæ, ℥vi.
Misce. Fiat collyrium, sæpe utendum.

3. Prescribe an anodyne eye-wash.

℞
Tincturæ Opii, ℥ii.
Liquoris Plumbi Subacetatis Diluti, ℥xii.
Misce. Fiat collyrium, sæpe utendum.

4. Write the formula for an enema of Castor-oil.

℞
Olei Ricini, ℥i.
Mellis, ℥i.
Mucilaginis Amyli, ℥x.
Misce pro enemate statim injiciendo.

5. Order a gargle to contain Borax.

℞
Mellis Boracis, ℥i.
Infusi Aurantii, ad ℥viii.
Misce. Colluentur fauces hoc gargarismate.

6. Prescribe a gargle of Potassium Chlorate.

℞
Potassii Chloratis, ℥i.
Acidi Hydrochlorici Diluti, ℥ii.
Infusi Rosæ Acidæ, ad ℥viii.
Misce. Fiat gargarisma, sæpe utendum.

7. Write for an injection of Silver Nitrate.

℞
Argenti Nitratis, gr. xviii.
Aquæ Destillatæ, ℥vi.
Misce. Fiat injectio, quæ in urethram injiciatur mane et nocte.

8. Prescribe a liniment containing Chloroform.

R

Chloroformi, ℥i.

Olei Olivæ, ℥ii.

Misce. Fiat linimentum, quocum fricetur pars affecta ter quaterve in dies.

9. Prescribe a lotion of Arnica.

R

Tincturæ Arnicæ, ℥iv.

Aquæ Rosæ, ℥iv.

Misce. Fiat lotio, partibus dolentibus applicanda ter in die.

10. Prescribe a lotion of Lead Subacetate.

R

Liquoris Plumbi Subacetatis, ℥i.

Acidi Acetici Diluti,

Spiritus Rectificati, ana ℥iv.

Aquæ Rosæ, ℥ix.

Misce. Fiat lotio.

11. Prescribe an ointment containing Quinine Sulphate.

R

Quininae Sulphatis, ℥i.

Acidi Sulphurici Diluti, ℥xxx.

Adipis Lanæ Hydrosi, ℥i.

Misce. Fiat unguentum ter in die utendum.

Our lessons are now brought to a close, but I would wish to add a few words of earnest admonition. I would desire to impress upon you that even if you have thoroughly mastered the precepts and examples which it has been my privilege to lay before you, you may not yet consider yourselves accomplished prescribers. Let me advise you to lose no opportunity of practical work in the compounding laboratory, and above all things to habituate yourselves to the practice of devising original formulæ.

PRESCRIPTIONS

Ointment containing Chloroform.

...um fricetur pars afflicta ter
... Arnica.

... lentibus applicanda ter in die.
... a lotion of Lead Subacetate.

... Subacetatis, ℞.
... vi. ana ℥iv.
... an ointment containing Quinine

... ℞.
... rici Diluti, ℥xxx.
... Hydr. si, ℥i.
... tum ter in die utendum.

... are now brought to a close, but I
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R. & R. CLARK, LIMITED, Edinburgh.



